



GCSE MATHEMATICS

FOUNDATION TIER

NUMBER PRACTICE BOOK

Modules 1-8 | 360 original questions | Full answers and marking guidance

Student name: _____

Target grade: _____ Start date: _____ Completion date: _____

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Contents and study plan

Work through Core Skills first, then Exam Practice and Grade 4–5 Challenge. Use Mixed Retrieval after a short gap. Mark each section and record topics that need another attempt.

Module	Topic	Specification	Score	Retry
1	Place Value, Ordering and Negative Numbers	N1, N2	___ / ___	☐
2	Four Operations and Priority	N2, N3	___ / ___	☐
3	Factors, Multiples and Primes	N4	___ / ___	☐
4	Powers, Roots and Indices	N6, N7	___ / ___	☐
5	Fractions and Mixed Numbers	N2, N8, N10	___ / ___	☐
6	Decimals and Percentages	N10, N12	___ / ___	☐
7	Standard Form	N9	___ / ___	☐
8	Estimation, Rounding and Accuracy	N14, N15, N16	___ / ___	☐

How the book is organised

- Core Skills — accessible fluency and essential procedures.
- Exam Practice — original questions using GCSE-style wording, marks and contexts.
- Grade 4–5 Challenge — multi-step reasoning and less familiar applications.
- Mixed Retrieval — short questions that revisit earlier Foundation knowledge.
- Answers — results, acceptable forms and concise marking guidance follow each module.

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Place Value, Ordering and Negative Numbers

CORE SKILLS • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Build accuracy and fluency. Complete every question.

1. Write these integers in ascending order: 7, -4, 0, -11, 3. [2 marks]

2. Insert <, > or = : -6 ____ -9 [1 mark]

3. Insert <, > or = : 0.407 ____ 0.47 [1 mark]

4. Write 58,304 in words. [1 mark]

5. What is the value of the digit 7 in 3,742,915? [1 mark]

6. Write 906,052 as a sum of place-value parts. [2 marks]

7. Arrange 0.62, $\frac{5}{8}$, 0.605 and 61% in descending order. [3 marks]

8. The temperature is -3°C . It falls by 8°C . Find the new temperature. [2 marks]



Place Value, Ordering and Negative Numbers

CORE SKILLS • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the core set. Check signs, place value and exact values.

9. A lift starts on floor -2 and rises 9 floors. Which floor does it reach? [2 marks]

10. Write the integer halfway between -14 and 6. [2 marks]

11. Which is nearer to zero: -17 or 12? Explain using distance from zero. [2 marks]

12. State the greatest integer that is less than -2.4. [1 mark]

13. Write the number that is 1000 greater than 249,780. [1 mark]

14. Complete the calculation: $-7 + \underline{\quad} = 5$. [1 mark]

15. Write -5, 8, -2 and 1 in order of increasing distance from zero. [2 marks]



Place Value, Ordering and Negative Numbers

EXAM PRACTICE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Original exam-style questions. Show each stage of your method.

- 1. A town records temperatures of -6°C , 2°C , -1°C , 5°C and -4°C . Find the range. [2 marks]**

- 2. Four cards show -8, -3, 4 and 9. Choose two different cards whose sum is closest to zero. State the sum. [3 marks]**

- 3. A number has 6 in the hundred-thousands place, 2 in the thousands place and 9 in the tens place. All other digits are zero. Write the number. [2 marks]**

- 4. Sam says -15 is greater than -9 because 15 is greater than 9. Explain the error. [2 marks]**

- 5. Put $\frac{7}{10}$, 68%, 0.705 and 0.69 in ascending order. [3 marks]**



Place Value, Ordering and Negative Numbers

EXAM PRACTICE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the exam set. Explain decisions where requested.

6. A submarine is at -38 m. It rises 17 m, then descends 26 m. Find its final depth. [3 marks]

7. The digits 2, 4, 6 and 8 are each used once to make a four-digit number. Make the greatest number below 7000 and the least number above 4000. [3 marks]

8. A point A represents -12 on a number line. Point B is 19 units to the right of A. Point C is 7 units to the left of B. Find C. [3 marks]

9. The population of a city is 507,090. Write the value of the digit 5 and the value of the digit 9. [2 marks]

10. Find the difference between -27 and 16. [2 marks]



Place Value, Ordering and Negative Numbers

EXAM PRACTICE • PART C

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the exam set. Check accuracy, units and presentation.

11. A bank balance is -£48. A payment of £75 is received, then £32 is spent. Find the new balance. [3 marks]

12. Write a decimal between 0.308 and 0.31. [1 mark]

13. Order -1.08, -1.8, -1.18 and -1.008 from smallest to largest. [3 marks]

14. A sequence starts at -20 and increases by 6 each time. Write the first term greater than zero. [2 marks]

15. The number $4\square7,205$ lies strictly between 437,205 and 457,205. List all possible digits for $\square$. [3 marks]



Place Value, Ordering and Negative Numbers

GRADE 4-5 CHALLENGE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Multi-step reasoning. Plan before calculating.

1. Three integers have a mean of -4. Two of them are -11 and 6. Find the third integer. [3 marks]

2. A number rounds to 42,000 to the nearest thousand. State the smallest possible integer and the largest possible integer. [3 marks]

3. Use each digit 0, 3, 5, 7 and 9 once to make the smallest five-digit number greater than 50,000. [3 marks]

4. The temperature changes from -7°C to 5°C , then falls by three times the size of that rise. Find the final temperature. [3 marks]

5. A is -18. B is halfway between A and 10. C is 9 less than B. Find C. [3 marks]



Place Value, Ordering and Negative Numbers

GRADE 4-5 CHALLENGE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the challenge set. Present a clear mathematical argument.

6. Put $13/20$, 0.66 , 64% and 0.659 in descending order. [3 marks]

7. Two different integers have an absolute difference of 17 and a sum of -5. Find the integers. [4 marks]

8. A four-digit number has 5 thousands. Its hundreds digit is twice its tens digit. Its units digit is 3, and its digits total 14. Find the number. [4 marks]

9. A diver is at -24 m. After moving the same distance twice in opposite directions, the diver finishes at -24 m. Give one possible pair of moves and explain why infinitely many pairs are possible. [3 marks]

10. Find an integer n such that $-4 < n/3 < 2$. Give all possible values. [4 marks]



Place Value, Ordering and Negative Numbers

MIXED RETRIEVAL

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Short retrieval practice. Work without notes where possible.

1. Calculate $384 + 597$. [1 mark]

2. Write 36 as a product of prime factors. [2 marks]

3. Calculate $\frac{3}{4}$ of 68. [2 marks]

4. Simplify the ratio 42:56. [2 marks]

5. Round 18.764 to 2 decimal places. [1 mark]



Four Operations and Priority

CORE SKILLS • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Build accuracy and fluency. Complete every question.

1. Calculate $384 + 759$. [2 marks]

2. Calculate $6027 + 895$. [2 marks]

3. Calculate $4705 + 2388$. [2 marks]

4. Calculate $901 - 478$. [2 marks]

5. Calculate $5000 - 2676$. [2 marks]

6. Calculate $8042 - 3957$. [2 marks]

7. Calculate 37×8 . [2 marks]

8. Calculate 124×6 . [2 marks]



Four Operations and Priority

CORE SKILLS • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the core set. Check signs, place value and exact values.

9. Calculate 53×24 . [2 marks]

10. Calculate $864 \div 12$. [2 marks]

11. Calculate $945 \div 15$. [2 marks]

12. Calculate $1728 \div 24$. [2 marks]

13. Calculate $18 + 6 \times 4$. [2 marks]

14. Calculate $(35 - 11) \div 6$. [2 marks]

15. Calculate $72 \div 8 + 5 \times 3$. [2 marks]



Four Operations and Priority

EXAM PRACTICE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Original exam-style questions. Show each stage of your method.

1. 6 identical items cost £17 each. A customer pays £120. Find the change. [3 marks]

2. 9 identical items cost £28 each. A customer pays £300. Find the change. [3 marks]

3. 7 identical items cost £45 each. A customer pays £400. Find the change. [3 marks]

4. 936 objects are shared equally between 12 groups. How many are in each group? [2 marks]

5. 1470 objects are shared equally between 15 groups. How many are in each group? [2 marks]



Four Operations and Priority

EXAM PRACTICE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Continue the exam set. Explain decisions where requested.

6. 2184 objects are shared equally between 24 groups. How many are in each group? [2 marks]

7. An account starts with £2400. £875 is paid in and £639 is taken out. Find the balance. [3 marks]

8. An account starts with £5000. £1278 is paid in and £1946 is taken out. Find the balance. [3 marks]

9. An account starts with £8750. £2265 is paid in and £3178 is taken out. Find the balance. [3 marks]

10. Evaluate $14 + 9 \times 7 - 9$. [3 marks]



Four Operations and Priority

EXAM PRACTICE • PART C

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the exam set. Check accuracy, units and presentation.

11. Evaluate $18 + 12 \times 5 - 12$. [3 marks]

12. Evaluate $25 + 8 \times 11 - 8$. [3 marks]

13. Use an inverse operation to check $1764 \div 21$. Give the quotient. [2 marks]

14. Use an inverse operation to check $3276 \div 28$. Give the quotient. [2 marks]

15. Use an inverse operation to check $4515 \div 35$. Give the quotient. [2 marks]



Four Operations and Priority

GRADE 4-5 CHALLENGE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Multi-step reasoning. Plan before calculating.

1. Calculate $8 + 3 \times (17 - 9)$. [3 marks]

2. Calculate $(96 \div 8 + 5) \times 4$. [3 marks]

3. Calculate $180 - 6 \times (14 + 9)$. [3 marks]

4. Calculate $7^2 - 5 \times 6$. [3 marks]

5. Calculate $(144 \div 12)^2 - 25$. [3 marks]



Four Operations and Priority

GRADE 4-5 CHALLENGE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the challenge set. Present a clear mathematical argument.

6. A theatre has 28 rows of 36 seats. 87 seats are empty. How many seats are occupied? [4 marks]

7. A school orders 18 boxes of 24 books and gives 157 books away. How many remain? [4 marks]

8. Insert brackets into $12 + 8 \times 5$ so the answer is 100. [3 marks]

9. Find the missing integer: $17 \times \square - 36 = 100$. [3 marks]

10. A number is multiplied by 9, then 47 is added. The result is 236. Find the number. [4 marks]



Four Operations and Priority

MIXED RETRIEVAL

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Short retrieval practice. Work without notes where possible.

1. Calculate $407 + 586$. [1 mark]

2. Calculate $900 - 347$. [1 mark]

3. Write 0.35 as a percentage. [1 mark]

4. Simplify 24:36. [2 marks]

5. Find the median of 3, 8, 4, 11, 6. [2 marks]



Factors, Multiples and Primes

CORE SKILLS • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Build accuracy and fluency. Complete every question.

1. List all positive factors of 36. [2 marks]

2. List all positive factors of 48. [2 marks]

3. List all positive factors of 60. [2 marks]

4. List all positive factors of 72. [2 marks]

5. List all positive factors of 90. [2 marks]

6. Find the highest common factor of 12 and 18. [2 marks]

7. Find the highest common factor of 24 and 36. [2 marks]

8. Find the highest common factor of 30 and 45. [2 marks]



Factors, Multiples and Primes

CORE SKILLS • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Continue the core set. Check signs, place value and exact values.

9. Find the lowest common multiple of 6 and 8. [2 marks]

10. Find the lowest common multiple of 12 and 15. [2 marks]

11. Find the lowest common multiple of 14 and 20. [2 marks]

12. Write 84 as a product of prime factors. [3 marks]

13. Write 120 as a product of prime factors. [3 marks]

14. Write 180 as a product of prime factors. [3 marks]

15. Write 210 as a product of prime factors. [3 marks]



Factors, Multiples and Primes

EXAM PRACTICE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Original exam-style questions. Show each stage of your method.

1. Two lights flash every 18 seconds and 24 seconds. They flash together now. After how many seconds will they next flash together? [3 marks]

2. A teacher has 48 red and 60 blue counters. Identical packs contain the same number of each colour with none left. Find the greatest number of packs. [3 marks]

3. Is 221 prime? Give a factor if it is not. [3 marks]

4. Use prime factors to find the HCF of 72 and 96. [3 marks]

5. Use prime factors to find the HCF of 84 and 126. [3 marks]



Factors, Multiples and Primes

EXAM PRACTICE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the exam set. Explain decisions where requested.

6. Use prime factors to find the HCF of 105 and 140. [3 marks]

7. Use prime factors to find the LCM of 18 and 30. [3 marks]

8. Use prime factors to find the LCM of 24 and 40. [3 marks]

9. Use prime factors to find the LCM of 28 and 42. [3 marks]

10. Write the smallest number greater than 100 that is divisible by both 6 and 15. [2 marks]



Factors, Multiples and Primes

EXAM PRACTICE • PART C

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the exam set. Check accuracy, units and presentation.

11. Find the missing prime: $2^3 \times 3 \times \square = 120$. [2 marks]

12. A number has exactly three factors and is less than 30. List all possible numbers. [4 marks]

13. Explain why 51 is not prime. [3 marks]

14. Find the greatest two-digit multiple of 14. [2 marks]

15. Find the least three-digit multiple of 18. [2 marks]



Factors, Multiples and Primes

GRADE 4-5 CHALLENGE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Multi-step reasoning. Plan before calculating.

1. Find the smallest positive integer divisible by 12, 15 and 18. [4 marks]

2. The HCF of two numbers is 6 and their LCM is 180. One number is 30. Find the other. [4 marks]

3. Find the smallest integer that must multiply 90 to make a square number. [4 marks]

4. Write 360 as a product of prime factors. [3 marks]

5. Three buses leave together every 20, 30 and 45 minutes. After how many hours do they next leave together? [4 marks]



Factors, Multiples and Primes

GRADE 4-5 CHALLENGE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the challenge set. Present a clear mathematical argument.

6. A number is a multiple of 8 and 12, lies between 100 and 150, and has digit sum 12. Find it. [4 marks]

7. Find two prime numbers with a sum of 36 and a difference of 10. [3 marks]

8. How many factors does 72 have? [4 marks]

9. Prove that the product of three consecutive integers is divisible by 6. [4 marks]

10. Find the greatest integer n such that n divides both 252 and 378. [3 marks]



Factors, Multiples and Primes

MIXED RETRIEVAL

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Short retrieval practice. Work without notes where possible.

1. Calculate $407 + 586$. [1 mark]

2. Calculate $900 - 347$. [1 mark]

3. Write 0.35 as a percentage. [1 mark]

4. Simplify 24:36. [2 marks]

5. Find the median of 3, 8, 4, 11, 6. [2 marks]



Powers, Roots and Indices

CORE SKILLS • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Build accuracy and fluency. Complete every question.

1. Calculate 2^6 . [1 mark]

2. Calculate 3^4 . [1 mark]

3. Calculate 5^3 . [1 mark]

4. Calculate 10^5 . [1 mark]

5. Find $\sqrt{49}$. [1 mark]

6. Find $\sqrt{81}$. [1 mark]

7. Find $\sqrt{144}$. [1 mark]

8. Find $\sqrt{225}$. [1 mark]



Powers, Roots and Indices

CORE SKILLS • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the core set. Check signs, place value and exact values.

9. Find the cube root of 27. [1 mark]

10. Find the cube root of 64. [1 mark]

11. Find the cube root of 125. [1 mark]

12. Simplify $2^3 \times 2^5$. [2 marks]

13. Simplify $7^6 \div 7^2$. [2 marks]

14. Write $1/5^3$ using a negative index. [2 marks]

15. Calculate 4^0 . [1 mark]



Powers, Roots and Indices

EXAM PRACTICE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Original exam-style questions. Show each stage of your method.

1. A square has area 196 cm^2 . Find its side length. [2 marks]

2. A cube has volume 512 cm^3 . Find its edge length. [2 marks]

3. Calculate $3^2 + 4^3$. [2 marks]

4. Simplify $x^4 \times x^3$. [2 marks]

5. Simplify $y^9 \div y^5$. [2 marks]



Powers, Roots and Indices

EXAM PRACTICE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the exam set. Explain decisions where requested.

6. Simplify $(a^3)^2$. [2 marks]

7. Write 64 as a power of 2. [2 marks]

8. Write 625 as a power of 5. [2 marks]

9. Calculate $2^5 \times 2^2 \div 2^3$. [3 marks]

10. Find n if $3^n = 243$. [2 marks]



Powers, Roots and Indices

EXAM PRACTICE • PART C

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the exam set. Check accuracy, units and presentation.

11. Order 2^6 , 4^3 and 8^2 . [3 marks]

12. A bacteria count doubles 7 times from 3. Find the final count. [3 marks]

13. Calculate $\sqrt{169}$ + cube root of 216. [2 marks]

14. Simplify $10^7 \div 10^3$. [2 marks]

15. Evaluate 5^{-2} . [2 marks]



Powers, Roots and Indices

GRADE 4-5 CHALLENGE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Multi-step reasoning. Plan before calculating.

1. Find the integer n: $2^n \times 2^3 = 2^{11}$. [3 marks]

2. Simplify $(3^2 \times 3^5) \div 3^4$. [3 marks]

3. Find the smallest integer k for which $2^k > 1000$. [3 marks]

4. A cube has surface area 486 cm^2 . Find its volume. [4 marks]

5. Show that $2^{10} - 2^9$ is a power of 2. [3 marks]



Powers, Roots and Indices

GRADE 4-5 CHALLENGE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the challenge set. Present a clear mathematical argument.

6. Find x if $\sqrt{x} = 17$. [2 marks]

7. Calculate $(2^3 + 3^2)^2$. [3 marks]

8. Write $1/81$ as a power of 3. [3 marks]

9. A square number and a cube number are both between 50 and 100. Find the number. [3 marks]

10. Simplify $p^7q^3 \times p^2q^5$. [3 marks]



Powers, Roots and Indices

MIXED RETRIEVAL

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Short retrieval practice. Work without notes where possible.

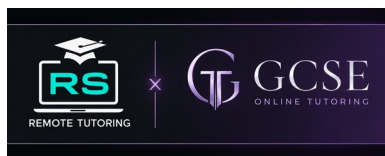
1. Calculate $407 + 586$. [1 mark]

2. Calculate $900 - 347$. [1 mark]

3. Write 0.35 as a percentage. [1 mark]

4. Simplify $24:36$. [2 marks]

5. Find the median of 3, 8, 4, 11, 6. [2 marks]



Fractions and Mixed Numbers

CORE SKILLS • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Build accuracy and fluency. Complete every question.

1. Calculate $\frac{1}{3} + \frac{1}{4}$. [2 marks]

2. Calculate $\frac{5}{8} + \frac{1}{6}$. [2 marks]

3. Calculate $\frac{7}{10} + \frac{3}{5}$. [2 marks]

4. Calculate $\frac{11}{12} + \frac{1}{8}$. [2 marks]

5. Calculate $\frac{5}{6} - \frac{1}{4}$. [2 marks]

6. Calculate $\frac{9}{10} - \frac{2}{5}$. [2 marks]

7. Calculate $\frac{7}{8} - \frac{1}{3}$. [2 marks]

8. Calculate $\frac{2}{3} \times \frac{3}{5}$. [2 marks]



Fractions and Mixed Numbers

CORE SKILLS • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the core set. Check signs, place value and exact values.

9. Calculate $7/8 \times 4/7$. [2 marks]

10. Calculate $5/6 \times 9/10$. [2 marks]

11. Calculate $3/4 \div 2/5$. [2 marks]

12. Calculate $7/9 \div 14/15$. [2 marks]

13. Calculate $5/8 \div 15/16$. [2 marks]

14. Convert $2 \frac{3}{5}$ to an improper fraction. [1 mark]

15. Convert $17/4$ to a mixed number. [1 mark]



Fractions and Mixed Numbers

EXAM PRACTICE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Original exam-style questions. Show each stage of your method.

1. Find $\frac{3}{8}$ of 240. [2 marks]

2. A tank is $\frac{5}{6}$ full. One quarter of the water is used. What fraction of a full tank remains? [3 marks]

3. Mia spends $\frac{2}{5}$ of £75. How much remains? [3 marks]

4. A $3\frac{1}{2}$ m ribbon is cut into pieces of length $\frac{1}{4}$ m. How many pieces? [3 marks]

5. Order $\frac{5}{8}$, $\frac{2}{3}$ and $\frac{7}{12}$. [3 marks]



Fractions and Mixed Numbers

EXAM PRACTICE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Continue the exam set. Explain decisions where requested.

6. A recipe uses $\frac{3}{4}$ cup per batch. How much is needed for $2\frac{1}{2}$ batches? [3 marks]

7. Find the missing fraction: $\square + \frac{7}{15} = \frac{4}{5}$. [2 marks]

8. A journey is 180 km. $\frac{2}{9}$ is by bus and $\frac{5}{12}$ by train. Find the remaining distance. [4 marks]

9. Write 0.375 as a fraction in simplest form. [2 marks]

10. Which is larger, $\frac{7}{11}$ or $\frac{5}{8}$? [2 marks]



Fractions and Mixed Numbers

EXAM PRACTICE • PART C

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the exam set. Check accuracy, units and presentation.

11. Calculate $1 \frac{2}{3} + 2 \frac{3}{4}$. [3 marks]

12. Calculate $5 \frac{1}{6} - 2 \frac{3}{4}$. [3 marks]

13. A class has 30 pupils. $\frac{2}{5}$ are boys. $\frac{1}{3}$ of the boys wear glasses. How many boys wear glasses? [3 marks]

14. A number multiplied by $\frac{3}{7}$ gives 18. Find the number. [3 marks]

15. Express 45 minutes as a fraction of 2 hours. [2 marks]



Fractions and Mixed Numbers

GRADE 4-5 CHALLENGE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Multi-step reasoning. Plan before calculating.

1. Calculate $2/3 + 3/4 \div 5/8$. [4 marks]

2. A tank is $3/5$ full. After adding 24 litres it is $9/10$ full. Find its capacity. [4 marks]

3. Find x : $x/3 + x/4 = 21$. [4 marks]

4. A fraction becomes $3/4$ when 2 is added to numerator and denominator. It was $2/3$ originally. Check this claim using an equivalent fraction. [4 marks]

5. Calculate $1 - (2/5 + 3/10)$. [2 marks]



Fractions and Mixed Numbers

GRADE 4-5 CHALLENGE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the challenge set. Present a clear mathematical argument.

6. Three quarters of a number is 18 more than half of it. Find the number. [4 marks]

7. A route is completed: $\frac{1}{3}$ Monday, $\frac{2}{5}$ of the remainder Tuesday. What fraction remains? [4 marks]

8. Find the reciprocal of $2\frac{2}{5}$. [2 marks]

9. Without decimals, decide whether $\frac{13}{20} > \frac{8}{13}$. [3 marks]

10. Calculate $(\frac{5}{6})^2 \div \frac{25}{18}$. [4 marks]



Fractions and Mixed Numbers

MIXED RETRIEVAL

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Short retrieval practice. Work without notes where possible.

1. Calculate $407 + 586$. [1 mark]

2. Calculate $900 - 347$. [1 mark]

3. Write 0.35 as a percentage. [1 mark]

4. Simplify 24:36. [2 marks]

5. Find the median of 3, 8, 4, 11, 6. [2 marks]



Decimals and Percentages

CORE SKILLS • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Build accuracy and fluency. Complete every question.

1. Write 0.4 as a percentage. [1 mark]

2. Write 0.075 as a percentage. [1 mark]

3. Write 1.25 as a percentage. [1 mark]

4. Write 0.008 as a percentage. [1 mark]

5. Write 35% as a decimal. [1 mark]

6. Write 7.5% as a decimal. [1 mark]

7. Write 125% as a decimal. [1 mark]

8. Write 0.6% as a decimal. [1 mark]



Decimals and Percentages

CORE SKILLS • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the core set. Check signs, place value and exact values.

9. Find 10% of 340. [2 marks]

10. Find 25% of 96. [2 marks]

11. Find 15% of 260. [2 marks]

12. Find 35% of 480. [2 marks]

13. Increase £80 by 20%. [2 marks]

14. Decrease 250 by 12%. [2 marks]

15. Write 0.625 as a fraction. [2 marks]



Decimals and Percentages

EXAM PRACTICE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Original exam-style questions. Show each stage of your method.

1. A £240 coat is reduced by 15%. Find the sale price. [3 marks]

2. A salary of £28,000 increases by 4%. Find the new salary. [3 marks]

3. A population falls from 850 to 782. Find the percentage decrease. [3 marks]

4. A value rises from 64 to 80. Find the percentage increase. [3 marks]

5. After a 20% discount, a game costs £36. Find the original price. [4 marks]



Decimals and Percentages

EXAM PRACTICE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Continue the exam set. Explain decisions where requested.

6. A price including 20% VAT is £78. Find the price before VAT. [4 marks]

7. Find 2.5% of 640. [2 marks]

8. A test score is 42 out of 60. Write it as a percentage. [2 marks]

9. Order 0.72, 71%, $\frac{3}{4}$ and 0.705. [3 marks]

10. A phone loses 18% of its value from £500. Find its new value. [3 marks]



Decimals and Percentages

EXAM PRACTICE • PART C

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the exam set. Check accuracy, units and presentation.

11. Simple interest is 3% per year on £1200 for 4 years. Find the interest. [3 marks]

12. A shop adds a 30% mark-up to £45. Find the selling price. [3 marks]

13. Write 12.5% as a fraction. [2 marks]

14. A quantity is multiplied by 1.07. Describe the percentage change. [2 marks]

15. A quantity is multiplied by 0.84. Describe the percentage change. [2 marks]



Decimals and Percentages

GRADE 4-5 CHALLENGE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Multi-step reasoning. Plan before calculating.

1. A price increases by 20% then decreases by 20%. Starting at £250, find the final price. [4 marks]

2. After a 15% increase a value is 414. Find the original value. [4 marks]

3. Two successive discounts of 10% and 20% are applied to £150. Find the final price. [4 marks]

4. A town grows by 5% each year from 8000. Find the population after 2 years. [4 marks]

5. An investment earns 4% compound interest for 3 years on £2000. Give the value to the nearest penny. [4 marks]



Decimals and Percentages

GRADE 4-5 CHALLENGE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the challenge set. Present a clear mathematical argument.

6. A number is increased by 30% to 91. Find the number. [3 marks]

7. 60% of A equals 45% of B. If A=90, find B. [4 marks]

8. A retailer wants a 25% profit on cost. An item sells for £75. Find the cost. [4 marks]

9. A score rises from 48 to 66. Find the percentage increase. [4 marks]

10. Explain why adding 10% then subtracting 10% is not neutral. [4 marks]



Decimals and Percentages

MIXED RETRIEVAL

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Short retrieval practice. Work without notes where possible.

1. Calculate $407 + 586$. [1 mark]

2. Calculate $900 - 347$. [1 mark]

3. Write 0.35 as a percentage. [1 mark]

4. Simplify 24:36. [2 marks]

5. Find the median of 3, 8, 4, 11, 6. [2 marks]



Standard Form

CORE SKILLS • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Build accuracy and fluency. Complete every question.

1. Write 450000 in standard form. [2 marks]

2. Write 7200000 in standard form. [2 marks]

3. Write 0.0038 in standard form. [2 marks]

4. Write 0.000056 in standard form. [2 marks]

5. Write 905000000 in standard form. [2 marks]

6. Write 3.4×10^5 as an ordinary number. [2 marks]

7. Write 7.02×10^3 as an ordinary number. [2 marks]

8. Write 6.8×10^{-4} as an ordinary number. [2 marks]



Standard Form

CORE SKILLS • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Continue the core set. Check signs, place value and exact values.

9. Write 9.15×10^{-6} as an ordinary number. [2 marks]

10. Write 1.2×10^8 as an ordinary number. [2 marks]

11. Order 3.2×10^5 and 4.1×10^4 . [2 marks]

12. Calculate $(3 \times 10^4) \times 2$. [2 marks]

13. Calculate $(8 \times 10^6) \div 4$. [2 marks]

14. Write 0.0000009 in standard form. [2 marks]

15. State the power of ten in 5.6×10^{-3} . [1 mark]



Standard Form

EXAM PRACTICE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Original exam-style questions. Show each stage of your method.

1. The distance is 1.5×10^8 km. Write it as an ordinary number. [2 marks]

2. A cell is 4.2×10^{-5} m long. Write this as a decimal. [2 marks]

3. Calculate $(3 \times 10^5)(4 \times 10^3)$. [3 marks]

4. Calculate $(8 \times 10^7) \div (2 \times 10^3)$. [3 marks]

5. Calculate $2.4 \times 10^6 + 3.1 \times 10^6$. [2 marks]



Standard Form

EXAM PRACTICE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Continue the exam set. Explain decisions where requested.

6. Calculate $7.5 \times 10^5 - 2.8 \times 10^5$. [2 marks]

7. Write 0.00036×2000 in standard form. [3 marks]

8. A file has 6×10^6 bytes. How many bytes in 25 files? [3 marks]

9. Which is larger: 8×10^{-4} or 2×10^{-3} ? [2 marks]

10. Put 3×10^4 , 2.9×10^5 and 8×10^3 in ascending order. [3 marks]



Standard Form

EXAM PRACTICE • PART C

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the exam set. Check accuracy, units and presentation.

11. The mass of one grain is 2.5×10^{-6} kg. Find the mass of 400 grains. [3 marks]

12. Write 64 million in standard form. [2 marks]

13. Write 0.045 billion as an ordinary number. [3 marks]

14. Calculate $(1.2 \times 10^8) \div 6$. [2 marks]

15. A calculator shows 3.75E-4. Write this in standard form. [2 marks]



Standard Form

GRADE 4-5 CHALLENGE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Multi-step reasoning. Plan before calculating.

1. Calculate $(6 \times 10^7)(3 \times 10^{-4})$. [4 marks]

2. Calculate $(9 \times 10^{-3}) \div (3 \times 10^5)$. [4 marks]

3. Calculate $4.8 \times 10^6 + 7.5 \times 10^5$. [4 marks]

4. A spacecraft travels 7.2×10^8 km in 3×10^4 hours. Find average speed. [4 marks]

5. One molecule has mass 3×10^{-23} g. Find mass of 8×10^{21} molecules. [4 marks]



Standard Form

GRADE 4-5 CHALLENGE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Complete the challenge set. Present a clear mathematical argument.

6. Find n : $(2 \times 10^n)(5 \times 10^3) = 1 \times 10^{12}$. [4 marks]

7. The ratio of 6×10^7 to 3×10^4 is what power-of-ten multiple? [3 marks]

8. Write 0.00000000047 in standard form. [2 marks]

9. Calculate $(2 \times 10^3)^3$. [4 marks]

10. Explain why 12×10^5 is not standard form and correct it. [3 marks]



Standard Form

MIXED RETRIEVAL

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Short retrieval practice. Work without notes where possible.

1. Calculate $407 + 586$. [1 mark]

2. Calculate $900 - 347$. [1 mark]

3. Write 0.35 as a percentage. [1 mark]

4. Simplify 24:36. [2 marks]

5. Find the median of 3, 8, 4, 11, 6. [2 marks]



Estimation, Rounding and Accuracy

CORE SKILLS • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Build accuracy and fluency. Complete every question.

1. Round 7.846 to 1 decimal place. [1 mark]

2. Round 13.275 to 2 decimal places. [1 mark]

3. Round 0.0974 to 3 decimal places. [1 mark]

4. Round 804.56 to 0 decimal places. [1 mark]

5. Round 5834 to 2 significant figures. [2 marks]

6. Round 0.007846 to 2 significant figures. [2 marks]

7. Round 97450 to 3 significant figures. [2 marks]

8. Round 65.049 to 3 significant figures. [2 marks]



Estimation, Rounding and Accuracy

CORE SKILLS • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the core set. Check signs, place value and exact values.

9. Estimate 19.8×4.13 by rounding each number to 1 significant figure. [2 marks]

10. Estimate $598 \div 19.7$ by rounding to 1 significant figure. [2 marks]

11. Write the error interval for $x=7.4$ correct to 1 decimal place. [2 marks]

12. Write the error interval for $n=230$ correct to nearest 10. [2 marks]

13. State the lower bound of 8.2 kg correct to 0.1 kg. [1 mark]

14. State the upper bound of 450 m correct to nearest 10 m. [1 mark]

15. A calculator gives 12.4987. Give a sensible money answer. [1 mark]



Estimation, Rounding and Accuracy

EXAM PRACTICE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Original exam-style questions. Show each stage of your method.

1. Estimate 48.7×0.203 . [2 marks]

2. Estimate $(79.6 + 21.2) \div 4.9$. [3 marks]

3. A length is 12.6 cm correct to 0.1 cm. State its bounds. [2 marks]

4. A mass is 3.4 kg correct to nearest 0.1 kg. Find the upper bound. [2 marks]

5. A journey is 180 km correct to nearest 10 km. State the lower bound. [2 marks]



Estimation, Rounding and Accuracy

EXAM PRACTICE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Continue the exam set. Explain decisions where requested.

6. A rectangle measures 8 cm by 5 cm, each correct to nearest cm. Find the upper bound for area. [4 marks]

7. A bag holds 2.5 kg correct to nearest 0.1 kg. Find the lower bound for 6 bags. [3 marks]

8. Round 0.004958 to 2 significant figures. [2 marks]

9. A crowd is 38,649. Round to the nearest thousand. [1 mark]

10. A value of 6.82 is truncated to 1 decimal place. State the result. [1 mark]



Estimation, Rounding and Accuracy

EXAM PRACTICE • PART C

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the exam set. Check accuracy, units and presentation.

11. A value is 71 correct to nearest whole number. State the error interval. [2 marks]

12. Estimate $302 \times 0.049 \div 1.98$. [3 marks]

13. A bill of £146.78 is shared by 6. Give a sensible amount each. [2 marks]

14. A coach holds 53 people. How many coaches are needed for 417 people? [3 marks]

15. A plank 4.8 m long is cut into 0.7 m pieces. How many complete pieces? [3 marks]



Estimation, Rounding and Accuracy

GRADE 4-5 CHALLENGE • PART A

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Multi-step reasoning. Plan before calculating.

- 1. A rectangle has length 12.4 cm and width 6.8 cm, each correct to 0.1 cm. Find the upper bound for area. [4 marks]**

- 2. Using the same measurements, find the lower bound for area. [4 marks]**

- 3. A speed is calculated using 150 m nearest 10 m and 12 s nearest second. Find the upper bound for speed. [4 marks]**

- 4. A number rounds to 4.2 to 1 decimal place and to 4 to the nearest whole number. State its combined interval. [4 marks]**

- 5. Find the greatest integer that rounds to 650 to the nearest 10. [3 marks]**



Estimation, Rounding and Accuracy

GRADE 4-5 CHALLENGE • PART B

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Complete the challenge set. Present a clear mathematical argument.

6. Estimate $\sqrt{82} \times 19.7$. [3 marks]

7. A measured mass is 5.0 kg to nearest 0.1 kg. Could the true mass be 5.051 kg? Explain. [3 marks]

8. The perimeter of a square is 36 cm correct to nearest cm. Find bounds for its side. [4 marks]

9. A quotient uses a numerator rounded to 40 nearest 10 and denominator rounded to 5 nearest 1. Find its upper bound. [4 marks]

10. Explain why intermediate values should not normally be rounded. [3 marks]



Estimation, Rounding and Accuracy

MIXED RETRIEVAL

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Short retrieval practice. Work without notes where possible.

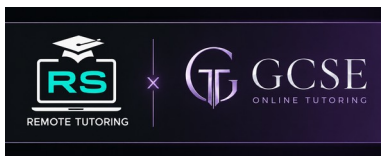
1. Calculate $407 + 586$. [1 mark]

2. Calculate $900 - 347$. [1 mark]

3. Write 0.35 as a percentage. [1 mark]

4. Simplify 24:36. [2 marks]

5. Find the median of 3, 8, 4, 11, 6. [2 marks]



FORMULAS, METHODS AND ANSWERS

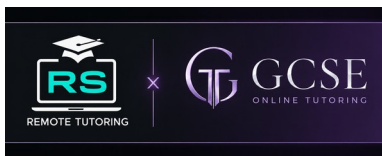
Modules 1–8 | Foundation Tier Number

FORMULA BANK • SUBSTITUTION • WORKED METHOD • FINAL ANSWER

Use this section only after attempting the practice questions. Each module begins with the formulas and procedures needed for its answer pages. Worked examples show substitution, calculation and final-answer presentation.

- Write the formula or method before substituting values.
- Keep exact values during intermediate steps.
- Include units and round only at the end unless instructed otherwise.
- Where a different valid method is used, award marks for mathematically correct working.

The answer tables for all eight modules follow these guides at the end of the book.



Place Value, Ordering and Negative Numbers

Foundation Tier | N1, N2

FORMULA BANK • SUBSTITUTION • WORKED METHOD • FINAL ANSWER

Formula and method bank

Use	Formula / method
Difference or range	largest value – smallest value
Midpoint	(first value + second value) $\div$ 2
Movement on a number line	new value = starting value + signed change
Decimal to percentage	decimal $\times$ 100%
Percentage to decimal	percentage $\div$ 100

Worked examples

1. Temperature range

$$5 - (-6) = 11^{\circ}\text{C}$$

2. Submarine depth

$$-38 + 17 - 26 = -47 \text{ m}$$

3. Fraction/decimal comparison

$$7/10 = 0.70 \text{ and } 68\% = 0.68, \text{ so } 0.68 < 0.69 < 0.70 < 0.705$$

Marking principle: award method marks for correct setup even if a later arithmetic slip occurs, unless the question is explicitly answer-only.

Four Operations and Priority

Foundation Tier | N2, N3

FORMULA BANK • SUBSTITUTION • WORKED METHOD • FINAL ANSWER

Formula and method bank

Use	Formula / method
Order of operations	Brackets → Indices → Division/Multiplication → Addition/Subtraction
Change	amount paid – total cost
Account balance	opening balance + money in – money out
Equal sharing	total ÷ number of groups
Inverse check for division	quotient × divisor = dividend

Worked examples

1. Item change

$$£120 - (6 \times £17) = £120 - £102 = £18$$

2. Account balance

$$£2400 + £875 - £639 = £2636$$

3. Solve an operation equation

$$17x - 36 = 100; 17x = 136; x = 8$$

Marking principle: award method marks for correct setup even if a later arithmetic slip occurs, unless the question is explicitly answer-only.

Factors, Multiples and Primes

Foundation Tier | N4

FORMULA BANK • SUBSTITUTION • WORKED METHOD • FINAL ANSWER

Formula and method bank

Use	Formula / method
Prime-factor form	write a number as a product of prime powers
HCF	take common primes using the smallest powers
LCM	take every prime using the largest powers
Three-factor numbers	the square of a prime has exactly three factors
Number of factors	if $n = p^a q^b$, number of factors = $(a+1)(b+1)$

Worked examples

1. HCF of 72 and 96

$$72 = 2^3 \times 3^2, 96 = 2^5 \times 3; \text{HCF} = 2^3 \times 3 = 24$$

2. LCM of 18 and 30

$$18 = 2 \times 3^2, 30 = 2 \times 3 \times 5; \text{LCM} = 2 \times 3^2 \times 5 = 90$$

3. Three repeating buses

$$\text{LCM}(20, 30, 45) = 180 \text{ minutes} = 3 \text{ hours}$$

Marking principle: award method marks for correct setup even if a later arithmetic slip occurs, unless the question is explicitly answer-only.

Powers, Roots and Indices

Foundation Tier | N6, N7

FORMULA BANK • SUBSTITUTION • WORKED METHOD • FINAL ANSWER

Formula and method bank

Use	Formula / method
Multiply same base	$a^m \times a^n = a^{(m+n)}$
Divide same base	$a^m \div a^n = a^{(m-n)}$
Power of a power	$(a^m)^n = a^{(mn)}$
Zero power	$a^0 = 1$ for $a \neq 0$
Negative index	$a^{-n} = 1/a^n$
Square/cube roots	$\sqrt[n]{a^2}=a$; cube root of $a^3 = a$

Worked examples

1. Index calculation

$$2^5 \times 2^2 \div 2^3 = 2^{(5+2-3)} = 2^4 = 16$$

2. Cube from surface area

$$6s^2=486; s^2=81; s=9; \text{volume}=9^3=729 \text{ cm}^3$$

3. Mixed powers

$$(2^3+3^2)^2=(8+9)^2=17^2=289$$

Marking principle: award method marks for correct setup even if a later arithmetic slip occurs, unless the question is explicitly answer-only.

Fractions and Mixed Numbers

Foundation Tier | N2, N8, N10

FORMULA BANK • SUBSTITUTION • WORKED METHOD • FINAL ANSWER

Formula and method bank

Use	Formula / method
Add/subtract fractions	use a common denominator, then add/subtract numerators
Multiply fractions	multiply numerators and multiply denominators
Divide fractions	multiply by the reciprocal
Fraction of an amount	amount $\times$ fraction
Mixed to improper	whole $\times$ denominator + numerator, over the denominator

Worked examples

1. Add fractions

$$1/3 + 1/4 = 4/12 + 3/12 = 7/12$$

2. Divide fractions

$$3/4 \div 2/5 = 3/4 \times 5/2 = 15/8 = 1 \frac{7}{8}$$

3. Remaining journey

$$1 - 2/9 - 5/12 = 13/36; 180 \times 13/36 = 65 \text{ km}$$

Marking principle: award method marks for correct setup even if a later arithmetic slip occurs, unless the question is explicitly answer-only.

Decimals and Percentages

Foundation Tier | N10, N12

FORMULA BANK • SUBSTITUTION • WORKED METHOD • FINAL ANSWER

Formula and method bank

Use	Formula / method
Percentage of an amount	$\text{amount} \times \text{percentage} \div 100$
Increase multiplier	$\text{new amount} = \text{original} \times (1 + \text{rate})$
Decrease multiplier	$\text{new amount} = \text{original} \times (1 - \text{rate})$
Reverse percentage	$\text{original} = \text{final} \div \text{multiplier}$
Simple interest	$\text{interest} = \text{principal} \times \text{rate} \times \text{time}$
Compound growth	$\text{final} = \text{principal} \times \text{multiplier}^{\text{number of periods}}$

Worked examples

1. 15% discount

$$£240 \times 0.85 = £204$$

2. Reverse a 20% discount

$$£36 \div 0.80 = £45$$

3. Compound interest

$$£2000 \times 1.04^3 = £2249.728 \approx £2249.73$$

Marking principle: award method marks for correct setup even if a later arithmetic slip occurs, unless the question is explicitly answer-only.

Formula and method bank

Use	Formula / method
Standard form	$a \times 10^n$ where $1 \leq a < 10$
Multiply	multiply the a-values; add powers
Divide	divide the a-values; subtract powers
Add/subtract	first rewrite using the same power of ten
Positive power	decimal point moves right
Negative power	decimal point moves left

Worked examples

1. Multiplication

$$(3 \times 10^5)(4 \times 10^3) = 12 \times 10^8 = 1.2 \times 10^9$$

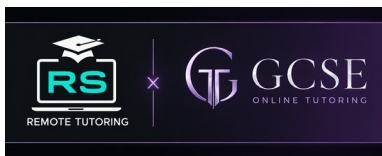
2. Division

$$(8 \times 10^7) \div (2 \times 10^3) = 4 \times 10^4$$

3. Different powers

$$4.8 \times 10^6 + 7.5 \times 10^5 = 4.8 \times 10^6 + 0.75 \times 10^6 = 5.55 \times 10^6$$

Marking principle: award method marks for correct setup even if a later arithmetic slip occurs, unless the question is explicitly answer-only.



Estimation, Rounding and Accuracy

Foundation Tier | N14, N15, N16

FORMULA BANK • SUBSTITUTION • WORKED METHOD • FINAL ANSWER

Formula and method bank

Use	Formula / method
Nearest unit interval	rounded value – half-unit $\leq x <$ rounded value + half-unit
Upper product bound	multiply upper bounds
Lower product bound	multiply lower bounds
Upper quotient bound	upper numerator $\div$ lower denominator
Lower quotient bound	lower numerator $\div$ upper denominator
Estimate	round inputs suitably, then calculate

Worked examples

1. 1 decimal place interval

7.4 means $7.35 \leq x < 7.45$

2. Upper area bound

$12.45 \times 6.85 = 85.2825 \text{ cm}^2$

3. Upper speed bound

distance $< 155 \text{ m}$ and time $\geq 11.5 \text{ s}$; upper speed $= 155 \div 11.5 \approx 13.48 \text{ m/s}$

Marking principle: award method marks for correct setup even if a later arithmetic slip occurs, unless the question is explicitly answer-only.



Place Value, Ordering and Negative Numbers

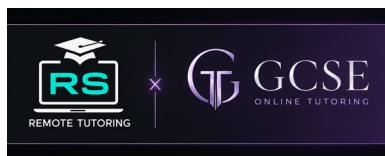
CORE SKILLS • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	-11, -4, 0, 3, 7	2	M1 method; A1 answer.
2	>	1	B1: correct result or statement.
3	<	1	B1: correct result or statement.
4	fifty-eight thousand three hundred and four	1	B1: correct result or statement.
5	700,000	1	B1: correct result or statement.
6	$900,000 + 6,000 + 50 + 2$	2	M1 method; A1 answer.
7	$\frac{5}{8}$, 0.62, 61%, 0.605	3	M1 setup; M1 process; A1 conclusion.
8	-11°C	2	M1 method; A1 answer.



Place Value, Ordering and Negative Numbers

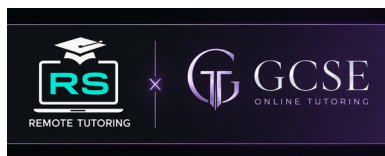
CORE SKILLS • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	floor 7	2	M1 method; A1 answer.
10	-4	2	M1 method; A1 answer.
11	12; its distance from zero is 12, compared with 17	2	M1 method; A1 answer.
12	-3	1	B1: correct result or statement.
13	250,780	1	B1: correct result or statement.
14	12	1	B1: correct result or statement.
15	1, -2, -5, 8	2	M1 method; A1 answer.



Place Value, Ordering and Negative Numbers

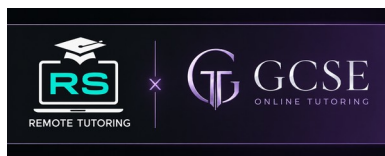
EXAM PRACTICE • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	11°C	2	M1 method; A1 answer.
2	-8 and 9; sum 1 (also -3 and 4; sum 1)	3	M1 setup; M1 process; A1 conclusion.
3	602,090	2	M1 method; A1 answer.
4	On a number line -15 lies to the left of -9, so $-15 < -9$	2	M1 method; A1 answer.
5	68%, 0.69, $7/10$, 0.705	3	M1 setup; M1 process; A1 conclusion.
6	-47 m	3	M1 setup; M1 process; A1 conclusion.
7	greatest below 7000: 6842; least above 4000: 4268	3	M1 setup; M1 process; A1 conclusion.
8	0	3	M1 setup; M1 process; A1 conclusion.



Place Value, Ordering and Negative Numbers

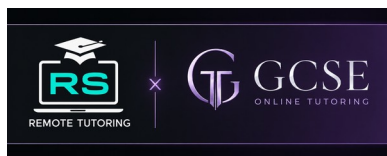
EXAM PRACTICE • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	500,000 and 90	2	M1 method; A1 answer.
10	43	2	M1 method; A1 answer.
11	-£5	3	M1 setup; M1 process; A1 conclusion.
12	Any value strictly between, e.g. 0.309	1	B1: correct result or statement.
13	-1.8, -1.18, -1.08, -1.008	3	M1 setup; M1 process; A1 conclusion.
14	4	2	M1 method; A1 answer.
15	4	3	M1 setup; M1 process; A1 conclusion.



Place Value, Ordering and Negative Numbers

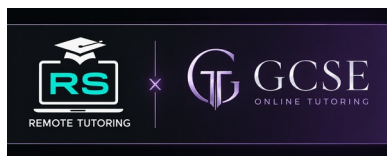
GRADE 4-5 CHALLENGE - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	-7	3	M1 setup; M1 process; A1 conclusion.
2	41,500 and 42,499	3	M1 setup; M1 process; A1 conclusion.
3	50,379	3	M1 setup; M1 process; A1 conclusion.
4	-31°C	3	M1 setup; M1 process; A1 conclusion.
5	-13	3	M1 setup; M1 process; A1 conclusion.
6	0.66, 0.659, 13/20, 64%	3	M1 setup; M1 process; A1 conclusion.
7	6 and -11	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
8	5,423	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
9	Example: rise 9 m then descend 9 m; any equal opposite pair has net change zero	3	M1 setup; M1 process; A1 conclusion.
10	-11 through 5 inclusive	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.



Place Value, Ordering and Negative Numbers

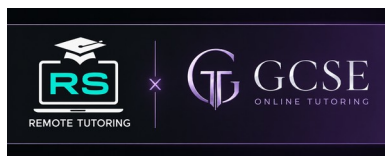
MIXED RETRIEVAL - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Marks	Check
1	981	1	B1: correct result or statement.
2	$2^2 \times 3^2$	2	M1 method; A1 answer.
3	51	2	M1 method; A1 answer.
4	3:4	2	M1 method; A1 answer.
5	18.76	1	B1: correct result or statement.



Four Operations and Priority

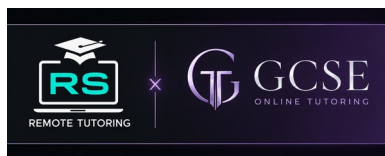
CORE SKILLS • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	1143	2	M1 method; A1 answer.
2	6922	2	M1 method; A1 answer.
3	7093	2	M1 method; A1 answer.
4	423	2	M1 method; A1 answer.
5	2324	2	M1 method; A1 answer.
6	4085	2	M1 method; A1 answer.
7	296	2	M1 method; A1 answer.
8	744	2	M1 method; A1 answer.



Four Operations and Priority

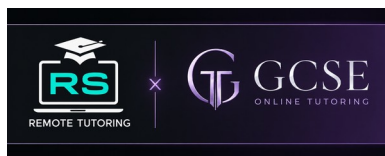
CORE SKILLS • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	1272	2	M1 method; A1 answer.
10	72	2	M1 method; A1 answer.
11	63	2	M1 method; A1 answer.
12	72	2	M1 method; A1 answer.
13	42	2	M1 method; A1 answer.
14	4	2	M1 method; A1 answer.
15	24	2	M1 method; A1 answer.



Four Operations and Priority

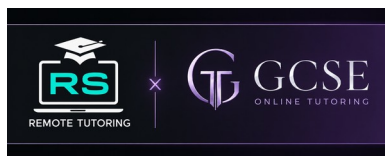
EXAM PRACTICE • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	£18	3	M1 setup; M1 process; A1 conclusion.
2	£48	3	M1 setup; M1 process; A1 conclusion.
3	£85	3	M1 setup; M1 process; A1 conclusion.
4	78	2	M1 method; A1 answer.
5	98	2	M1 method; A1 answer.
6	91	2	M1 method; A1 answer.
7	£2636	3	M1 setup; M1 process; A1 conclusion.
8	£4332	3	M1 setup; M1 process; A1 conclusion.



Four Operations and Priority

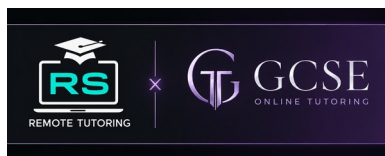
EXAM PRACTICE • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	£7837	3	M1 setup; M1 process; A1 conclusion.
10	68	3	M1 setup; M1 process; A1 conclusion.
11	66	3	M1 setup; M1 process; A1 conclusion.
12	105	3	M1 setup; M1 process; A1 conclusion.
13	84	2	M1 method; A1 answer.
14	117	2	M1 method; A1 answer.
15	129	2	M1 method; A1 answer.



Four Operations and Priority

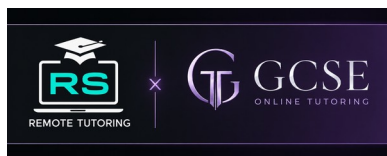
GRADE 4-5 CHALLENGE - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	32	3	M1 setup; M1 process; A1 conclusion.
2	68	3	M1 setup; M1 process; A1 conclusion.
3	42	3	M1 setup; M1 process; A1 conclusion.
4	19	3	M1 setup; M1 process; A1 conclusion.
5	119	3	M1 setup; M1 process; A1 conclusion.
6	921	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
7	275	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
8	$(12 + 8) \times 5$	3	M1 setup; M1 process; A1 conclusion.
9	8	3	M1 setup; M1 process; A1 conclusion.
10	21	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.



Four Operations and Priority

MIXED RETRIEVAL - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	993	1	B1: correct result or statement.
2	553	1	B1: correct result or statement.
3	35%	1	B1: correct result or statement.
4	2:3	2	M1 method; A1 answer.
5	6	2	M1 method; A1 answer.



Factors, Multiples and Primes

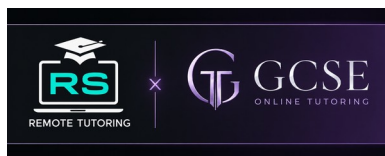
CORE SKILLS • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	1, 2, 3, 4, 6, 9, 12, 18, 36	2	M1 method; A1 answer.
2	1, 2, 3, 4, 6, 8, 12, 16, 24, 48	2	M1 method; A1 answer.
3	1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60	2	M1 method; A1 answer.
4	1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72	2	M1 method; A1 answer.
5	1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90	2	M1 method; A1 answer.
6	6	2	M1 method; A1 answer.
7	12	2	M1 method; A1 answer.
8	15	2	M1 method; A1 answer.



Factors, Multiples and Primes

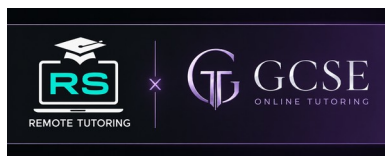
CORE SKILLS • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	24	2	M1 method; A1 answer.
10	60	2	M1 method; A1 answer.
11	140	2	M1 method; A1 answer.
12	$2^2 \times 3 \times 7$	3	M1 setup; M1 process; A1 conclusion.
13	$2^3 \times 3 \times 5$	3	M1 setup; M1 process; A1 conclusion.
14	$2^2 \times 3^2 \times 5$	3	M1 setup; M1 process; A1 conclusion.
15	$2 \times 3 \times 5 \times 7$	3	M1 setup; M1 process; A1 conclusion.



Factors, Multiples and Primes

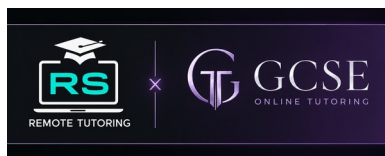
EXAM PRACTICE • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	72	3	M1 setup; M1 process; A1 conclusion.
2	12	3	M1 setup; M1 process; A1 conclusion.
3	No; $13 \times 17 = 221$	3	M1 setup; M1 process; A1 conclusion.
4	24	3	M1 setup; M1 process; A1 conclusion.
5	42	3	M1 setup; M1 process; A1 conclusion.
6	35	3	M1 setup; M1 process; A1 conclusion.
7	90	3	M1 setup; M1 process; A1 conclusion.
8	120	3	M1 setup; M1 process; A1 conclusion.



Factors, Multiples and Primes

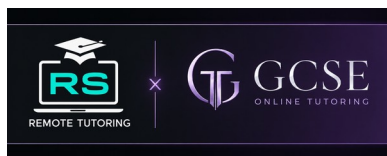
EXAM PRACTICE • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	84	3	M1 setup; M1 process; A1 conclusion.
10	120	2	M1 method; A1 answer.
11	5	2	M1 method; A1 answer.
12	4, 9, 25	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
13	Its digits sum to 6, so it is divisible by 3; $51 = 3 \times 17$	3	M1 setup; M1 process; A1 conclusion.
14	98	2	M1 method; A1 answer.
15	108	2	M1 method; A1 answer.



Factors, Multiples and Primes

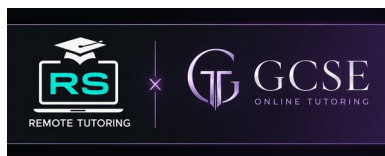
GRADE 4-5 CHALLENGE - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	180	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
2	36	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
3	10	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
4	$2^3 \times 3^2 \times 5$	3	M1 setup; M1 process; A1 conclusion.
5	3 hours	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
6	120	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
7	13 and 23	3	M1 setup; M1 process; A1 conclusion.
8	12	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
9	One is even and one is divisible by 3, so their product contains factors 2 and 3	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
10	126	3	M1 setup; M1 process; A1 conclusion.



Factors, Multiples and Primes

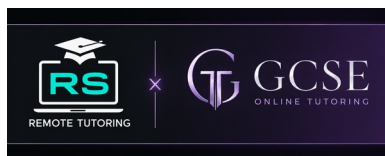
MIXED RETRIEVAL - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	993	1	B1: correct result or statement.
2	553	1	B1: correct result or statement.
3	35%	1	B1: correct result or statement.
4	2:3	2	M1 method; A1 answer.
5	6	2	M1 method; A1 answer.



Powers, Roots and Indices

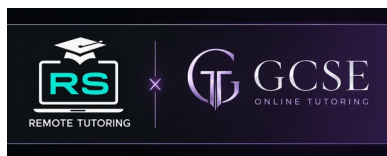
CORE SKILLS • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	64	1	B1: correct result or statement.
2	81	1	B1: correct result or statement.
3	125	1	B1: correct result or statement.
4	100000	1	B1: correct result or statement.
5	7	1	B1: correct result or statement.
6	9	1	B1: correct result or statement.
7	12	1	B1: correct result or statement.
8	15	1	B1: correct result or statement.



Powers, Roots and Indices

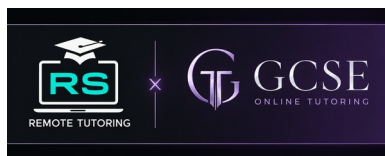
CORE SKILLS • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	3	1	B1: correct result or statement.
10	4	1	B1: correct result or statement.
11	5	1	B1: correct result or statement.
12	2^8	2	M1 method; A1 answer.
13	7^4	2	M1 method; A1 answer.
14	5^{-3}	2	M1 method; A1 answer.
15	1	1	B1: correct result or statement.



Powers, Roots and Indices

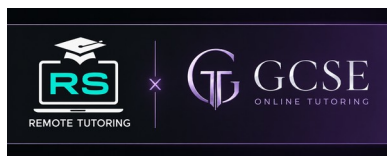
EXAM PRACTICE • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	14 cm	2	M1 method; A1 answer.
2	8 cm	2	M1 method; A1 answer.
3	73	2	M1 method; A1 answer.
4	x^7	2	M1 method; A1 answer.
5	y^4	2	M1 method; A1 answer.
6	a^6	2	M1 method; A1 answer.
7	2^6	2	M1 method; A1 answer.
8	5^4	2	M1 method; A1 answer.



Powers, Roots and Indices

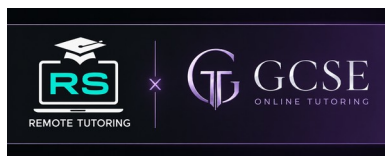
EXAM PRACTICE • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	16	3	M1 setup; M1 process; A1 conclusion.
10	5	2	M1 method; A1 answer.
11	They are equal; each is 64	3	M1 setup; M1 process; A1 conclusion.
12	384	3	M1 setup; M1 process; A1 conclusion.
13	19	2	M1 method; A1 answer.
14	10^4	2	M1 method; A1 answer.
15	$1/25$	2	M1 method; A1 answer.



Powers, Roots and Indices

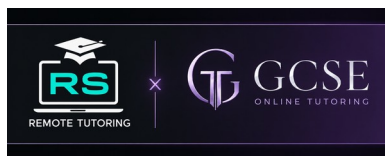
GRADE 4-5 CHALLENGE - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	8	3	M1 setup; M1 process; A1 conclusion.
2	3^3	3	M1 setup; M1 process; A1 conclusion.
3	10	3	M1 setup; M1 process; A1 conclusion.
4	729 cm^3	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
5	$2^9(2-1)=2^9$	3	M1 setup; M1 process; A1 conclusion.
6	289	2	M1 method; A1 answer.
7	289	3	M1 setup; M1 process; A1 conclusion.
8	3^{-4}	3	M1 setup; M1 process; A1 conclusion.
9	64	3	M1 setup; M1 process; A1 conclusion.
10	p^9q^8	3	M1 setup; M1 process; A1 conclusion.



Powers, Roots and Indices

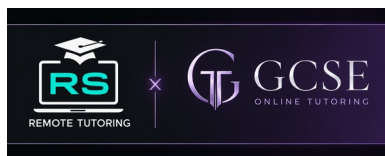
MIXED RETRIEVAL - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	993	1	B1: correct result or statement.
2	553	1	B1: correct result or statement.
3	35%	1	B1: correct result or statement.
4	2:3	2	M1 method; A1 answer.
5	6	2	M1 method; A1 answer.



Fractions and Mixed Numbers

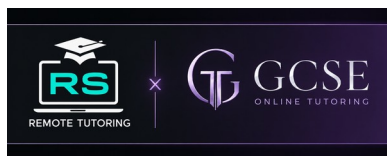
CORE SKILLS • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	$7/12$	2	M1 method; A1 answer.
2	$19/24$	2	M1 method; A1 answer.
3	$13/10$	2	M1 method; A1 answer.
4	$25/24$	2	M1 method; A1 answer.
5	$7/12$	2	M1 method; A1 answer.
6	$1/2$	2	M1 method; A1 answer.
7	$13/24$	2	M1 method; A1 answer.
8	$2/5$	2	M1 method; A1 answer.



Fractions and Mixed Numbers

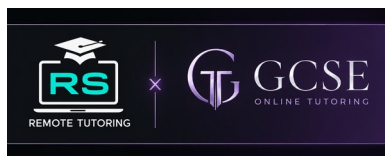
CORE SKILLS • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	$\frac{1}{2}$	2	M1 method; A1 answer.
10	$\frac{3}{4}$	2	M1 method; A1 answer.
11	$\frac{15}{8}$	2	M1 method; A1 answer.
12	$\frac{5}{6}$	2	M1 method; A1 answer.
13	$\frac{2}{3}$	2	M1 method; A1 answer.
14	$\frac{13}{5}$	1	B1: correct result or statement.
15	$4 \frac{1}{4}$	1	B1: correct result or statement.



Fractions and Mixed Numbers

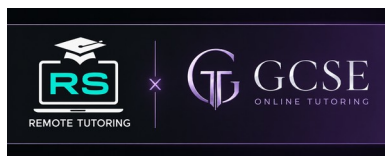
EXAM PRACTICE • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	90	2	M1 method; A1 answer.
2	$\frac{5}{8}$	3	M1 setup; M1 process; A1 conclusion.
3	£45	3	M1 setup; M1 process; A1 conclusion.
4	14	3	M1 setup; M1 process; A1 conclusion.
5	$\frac{7}{12}$, $\frac{5}{8}$, $\frac{2}{3}$	3	M1 setup; M1 process; A1 conclusion.
6	1 $\frac{7}{8}$ cups	3	M1 setup; M1 process; A1 conclusion.
7	$\frac{1}{3}$	2	M1 method; A1 answer.
8	65 km	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.



Fractions and Mixed Numbers

EXAM PRACTICE • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	$\frac{3}{8}$	2	M1 method; A1 answer.
10	$\frac{7}{11}$	2	M1 method; A1 answer.
11	$4 \frac{5}{12}$	3	M1 setup; M1 process; A1 conclusion.
12	$2 \frac{5}{12}$	3	M1 setup; M1 process; A1 conclusion.
13	4	3	M1 setup; M1 process; A1 conclusion.
14	42	3	M1 setup; M1 process; A1 conclusion.
15	$\frac{3}{8}$	2	M1 method; A1 answer.



Fractions and Mixed Numbers

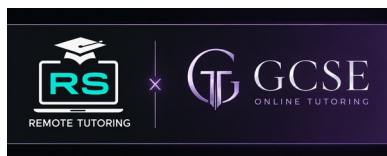
GRADE 4-5 CHALLENGE - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	28/15 or 1 13/15	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
2	80 litres	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
3	36	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
4	$2/3 = 4/6$; $(4+2)/(6+2)=6/8=3/4$	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
5	3/10	2	M1 method; A1 answer.
6	72	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
7	2/5	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
8	5/12	2	M1 method; A1 answer.
9	Yes; $169/260 > 160/260$	3	M1 setup; M1 process; A1 conclusion.
10	1/2	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.



Fractions and Mixed Numbers

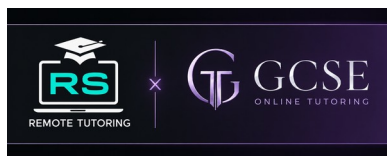
MIXED RETRIEVAL - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	993	1	B1: correct result or statement.
2	553	1	B1: correct result or statement.
3	35%	1	B1: correct result or statement.
4	2:3	2	M1 method; A1 answer.
5	6	2	M1 method; A1 answer.



Decimals and Percentages

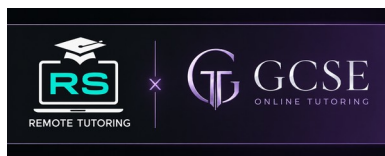
CORE SKILLS • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	40%	1	B1: correct result or statement.
2	7.5%	1	B1: correct result or statement.
3	125%	1	B1: correct result or statement.
4	0.8%	1	B1: correct result or statement.
5	0.35	1	B1: correct result or statement.
6	0.075	1	B1: correct result or statement.
7	1.25	1	B1: correct result or statement.
8	0.006	1	B1: correct result or statement.



Decimals and Percentages

CORE SKILLS • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	34	2	M1 method; A1 answer.
10	24	2	M1 method; A1 answer.
11	39	2	M1 method; A1 answer.
12	168	2	M1 method; A1 answer.
13	£96	2	M1 method; A1 answer.
14	220	2	M1 method; A1 answer.
15	5/8	2	M1 method; A1 answer.



Decimals and Percentages

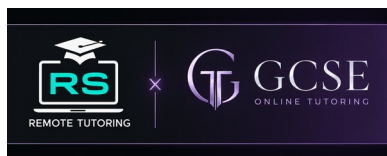
EXAM PRACTICE • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Marks	Check
1	£204	3	M1 setup; M1 process; A1 conclusion.
2	£29,120	3	M1 setup; M1 process; A1 conclusion.
3	8%	3	M1 setup; M1 process; A1 conclusion.
4	25%	3	M1 setup; M1 process; A1 conclusion.
5	£45	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
6	£65	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
7	16	2	M1 method; A1 answer.
8	70%	2	M1 method; A1 answer.



Decimals and Percentages

EXAM PRACTICE • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Marks	Check
9	0.705, 71%, 0.72, 3/4	3	M1 setup; M1 process; A1 conclusion.
10	£410	3	M1 setup; M1 process; A1 conclusion.
11	£144	3	M1 setup; M1 process; A1 conclusion.
12	£58.50	3	M1 setup; M1 process; A1 conclusion.
13	1/8	2	M1 method; A1 answer.
14	7% increase	2	M1 method; A1 answer.
15	16% decrease	2	M1 method; A1 answer.



Decimals and Percentages

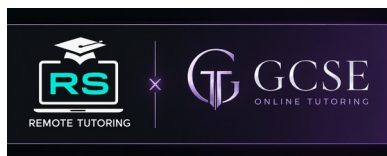
GRADE 4-5 CHALLENGE - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	£240	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
2	360	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
3	£108	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
4	8820	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
5	£2249.73	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
6	70	3	M1 setup; M1 process; A1 conclusion.
7	120	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
8	£60	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
9	37.5%	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
10	The second 10% uses a different base; the net multiplier is $1.1 \times 0.9 = 0.99$, a 1% decrease	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.



Decimals and Percentages

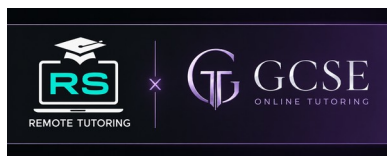
MIXED RETRIEVAL - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	993	1	B1: correct result or statement.
2	553	1	B1: correct result or statement.
3	35%	1	B1: correct result or statement.
4	2:3	2	M1 method; A1 answer.
5	6	2	M1 method; A1 answer.



Standard Form

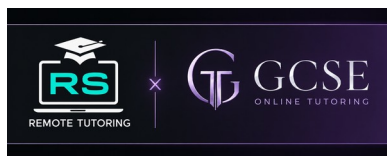
CORE SKILLS • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	4.5×10^5	2	M1 method; A1 answer.
2	7.2×10^6	2	M1 method; A1 answer.
3	3.8×10^{-3}	2	M1 method; A1 answer.
4	5.6×10^{-5}	2	M1 method; A1 answer.
5	9.05×10^8	2	M1 method; A1 answer.
6	340000.0	2	M1 method; A1 answer.
7	7020.00	2	M1 method; A1 answer.
8	0.00068	2	M1 method; A1 answer.



Standard Form

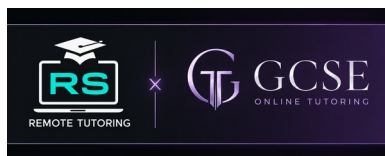
CORE SKILLS • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	0.00000915	2	M1 method; A1 answer.
10	120000000.0	2	M1 method; A1 answer.
11	4.1×10^4 , 3.2×10^5	2	M1 method; A1 answer.
12	6×10^4	2	M1 method; A1 answer.
13	2×10^6	2	M1 method; A1 answer.
14	9×10^{-7}	2	M1 method; A1 answer.
15	-3	1	B1: correct result or statement.



Standard Form

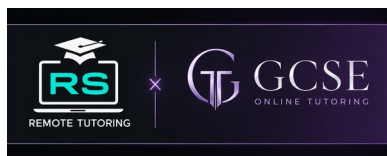
EXAM PRACTICE • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	150,000,000 km	2	M1 method; A1 answer.
2	0.000042 m	2	M1 method; A1 answer.
3	1.2×10^9	3	M1 setup; M1 process; A1 conclusion.
4	4×10^4	3	M1 setup; M1 process; A1 conclusion.
5	5.5×10^6	2	M1 method; A1 answer.
6	4.7×10^5	2	M1 method; A1 answer.
7	7.2×10^{-1}	3	M1 setup; M1 process; A1 conclusion.
8	1.5×10^8	3	M1 setup; M1 process; A1 conclusion.



Standard Form

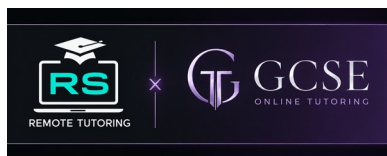
EXAM PRACTICE • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	2×10^{-3}	2	M1 method; A1 answer.
10	$8 \times 10^3, 3 \times 10^4, 2.9 \times 10^5$	3	M1 setup; M1 process; A1 conclusion.
11	$1 \times 10^{-3} \text{ kg}$	3	M1 setup; M1 process; A1 conclusion.
12	6.4×10^7	2	M1 method; A1 answer.
13	45,000,000	3	M1 setup; M1 process; A1 conclusion.
14	2×10^7	2	M1 method; A1 answer.
15	3.75×10^{-4}	2	M1 method; A1 answer.



Standard Form

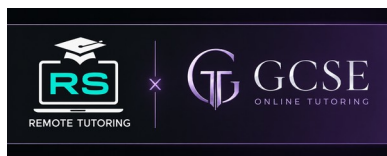
GRADE 4-5 CHALLENGE - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	1.8×10^4	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
2	3×10^{-8}	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
3	5.55×10^6	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
4	2.4×10^4 km/h	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
5	2.4×10^{-1} g	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
6	8	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
7	2000	3	M1 setup; M1 process; A1 conclusion.
8	4.7×10^{-10}	2	M1 method; A1 answer.
9	8×10^9	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
10	The leading number must be at least 1 and less than 10; 1.2×10^6	3	M1 setup; M1 process; A1 conclusion.



Standard Form

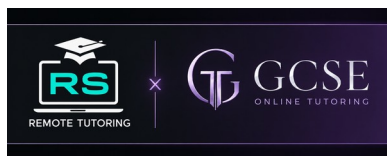
MIXED RETRIEVAL - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	993	1	B1: correct result or statement.
2	553	1	B1: correct result or statement.
3	35%	1	B1: correct result or statement.
4	2:3	2	M1 method; A1 answer.
5	6	2	M1 method; A1 answer.



Estimation, Rounding and Accuracy

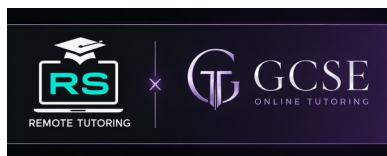
CORE SKILLS • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	7.8	1	B1: correct result or statement.
2	13.28	1	B1: correct result or statement.
3	0.097	1	B1: correct result or statement.
4	805.0	1	B1: correct result or statement.
5	5800	2	M1 method; A1 answer.
6	0.0078	2	M1 method; A1 answer.
7	97500	2	M1 method; A1 answer.
8	65.0	2	M1 method; A1 answer.



Estimation, Rounding and Accuracy

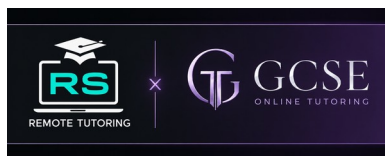
CORE SKILLS • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	80	2	M1 method; A1 answer.
10	30	2	M1 method; A1 answer.
11	$7.35 \leq x < 7.45$	2	M1 method; A1 answer.
12	$225 \leq n < 235$	2	M1 method; A1 answer.
13	8.15 kg	1	B1: correct result or statement.
14	455 m	1	B1: correct result or statement.
15	£12.50	1	B1: correct result or statement.



Estimation, Rounding and Accuracy

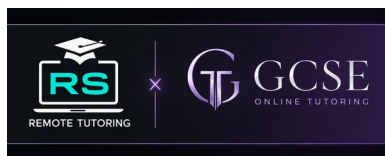
EXAM PRACTICE • PART A - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	10	2	M1 method; A1 answer.
2	20	3	M1 setup; M1 process; A1 conclusion.
3	$12.55 \leq L < 12.65$	2	M1 method; A1 answer.
4	3.45 kg	2	M1 method; A1 answer.
5	175 km	2	M1 method; A1 answer.
6	46.75 cm ²	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
7	14.7 kg	3	M1 setup; M1 process; A1 conclusion.
8	0.0050	2	M1 method; A1 answer.



Estimation, Rounding and Accuracy

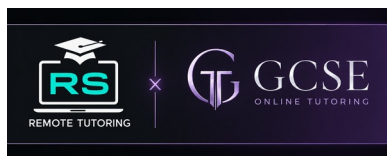
EXAM PRACTICE • PART B - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
9	39000	1	B1: correct result or statement.
10	6.8	1	B1: correct result or statement.
11	$70.5 \leq x < 71.5$	2	M1 method; A1 answer.
12	7.5	3	M1 setup; M1 process; A1 conclusion.
13	£24.46 each	2	M1 method; A1 answer.
14	8	3	M1 setup; M1 process; A1 conclusion.
15	6	3	M1 setup; M1 process; A1 conclusion.



Estimation, Rounding and Accuracy

GRADE 4-5 CHALLENGE - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: _____ / _____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	85.2825 cm ²	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
2	83.3625 cm ²	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
3	155/11.5 $\approx$ 13.48 m/s	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
4	$4.15 \leq x < 4.25$	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
5	654	3	M1 setup; M1 process; A1 conclusion.
6	180	3	M1 setup; M1 process; A1 conclusion.
7	No; $4.95 \leq m < 5.05$	3	M1 setup; M1 process; A1 conclusion.
8	$8.875 \leq s < 9.125$ cm	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
9	$45/4.5 = 10$	4	M1 setup; M1 development; A1 accuracy; A1 conclusion.
10	Rounding early accumulates error and can change the final rounded answer	3	M1 setup; M1 process; A1 conclusion.



Estimation, Rounding and Accuracy

MIXED RETRIEVAL - ANSWERS

FOUNDATION TIER • SHOW CLEAR WORKING • WRITE UNITS WHERE REQUIRED

Name: _____ Date: _____ Score: ____ / ____

Use the formula/method guides in the consolidated solutions section. Award method marks where the setup is correct.

Q	Answer / concise method	Mark s	Check
1	993	1	B1: correct result or statement.
2	553	1	B1: correct result or statement.
3	35%	1	B1: correct result or statement.
4	2:3	2	M1 method; A1 answer.
5	6	2	M1 method; A1 answer.