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GCSE MATHEMATICS
FOUNDATION TIER

UNIT 3: RATIO, PROPORTION & RATES

16 chapters | 192 curated questions | 1-4 marks

Student name: _____

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Contents and publication statement

This curated Foundation edition prioritises distinct tasks, accurate tier boundaries, clear working space and visible reasoning. Marks indicate an independent teaching allocation, not an official Eduqas mark scheme.

Chapter	Specification topic
1	FR1 - Changing units
2	FR2 - Density and pressure
3	FR3 - Scale drawings and maps
4	FR4 - One quantity as a fraction of another
5	FR5 - Ratio notation and simplification
6	FR6 - Sharing and dividing in a ratio
7	FR7 - Multiplicative relationships
8	FR8 - Proportion as equal ratios
9	FR9 - Ratios, fractions and linear functions
10	FR10 - Percentages and financial mathematics
11	FR11 - Direct and inverse proportion
12	FR12 - Compound units
13	FR13 - Scale factors for length, area and volume
14	FR14 - Equations for proportion
15	FR15 - Rates of change and proportional graphs
16	FR16 - Growth, decay and compound interest

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FOUNDATION TIER

UNIT 3 | CHAPTER 1

FR1 - Changing units

12 curated questions | complete solutions

Chapter focus

Convert between standard and compound units in numerical and algebraic contexts.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 1: FR1 - Changing units

Q01 | 2 MARKS

Convert 1.55 km to metres.

Q02 | 2 MARKS

Convert 1600 g to kilograms.

Chapter 1: FR1 - Changing units

Q03 | 2 MARKS

Convert 91 minutes to hours and minutes.

Q04 | 3 MARKS

Convert 12 m/s to km/h.

Chapter 1: FR1 - Changing units

Q05 | 2 MARKS

Convert 2.95 km to metres.

Q06 | 2 MARKS

Convert 2300 g to kilograms.

Chapter 1: FR1 - Changing units

Q07 | 2 MARKS

Convert 119 minutes to hours and minutes.

Q08 | 3 MARKS

Convert 16 m/s to km/h.

Chapter 1: FR1 - Changing units

Q09 | 3 MARKS

Convert 11 m^2 to cm^2.

Q10 | 3 MARKS

Convert 75000 cm^2 to m^2.

Chapter 1: FR1 - Changing units

Q11 | 3 MARKS

Convert 13 m^3 to cm^3.

Q12 | 3 MARKS

Convert 4.5 litres to cm^3.

Worked solutions

Q01 | 2 MARKS

Multiply by 1000: 1.55 km=1550 m.

ANSWER: 1550 m

Q02 | 2 MARKS

Divide by 1000: 1600 g=1.6 kg.

ANSWER: 1.6 kg

Worked solutions

Q03 | 2 MARKS

91÷60 gives 1 complete hour(s) and 31 minutes.

ANSWER: 1 h 31 min

Q04 | 3 MARKS

Multiply by 3.6: 12x3.6=43.2 km/h.

ANSWER: 43.2 km/h

Worked solutions

Q05 | 2 MARKS

Multiply by 1000: 2.95 km=2950 m.

ANSWER: 2950 m

Q06 | 2 MARKS

Divide by 1000: 2300 g=2.3 kg.

ANSWER: 2.3 kg

Worked solutions

Q07 | 2 MARKS

119÷60 gives 1 complete hour(s) and 59 minutes.

ANSWER: 1 h 59 min

Q08 | 3 MARKS

Multiply by 3.6: 16x3.6=57.6 km/h.

ANSWER: 57.6 km/h

Worked solutions

Q09 | 3 MARKS

1 m^2=10,000 cm^2, so multiply by 10,000.

ANSWER: 110000 cm^2

Q10 | 3 MARKS

Divide by 10,000 because 1 m^2=10,000 cm^2.

ANSWER: 7.5 m^2

Worked solutions

Q11 | 3 MARKS

1 m^3=1,000,000 cm^3, so multiply by 1,000,000.

ANSWER: 13000000 cm^3

Q12 | 3 MARKS

1 litre=1000 cm^3, so multiply by 1000.

ANSWER: 4500 cm^3

Chapter completion record

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UNIT 3 | CHAPTER 2

FR2 - Density and pressure

12 curated questions | complete solutions

Chapter focus

Use density = mass/volume and pressure = force/area.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

Source-use notice

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Chapter 2: FR2 - Density and pressure

Q01 | 3 MARKS

A material has mass 75 g and volume 25 cm³. Find its density.

Q02 | 3 MARKS

A substance has density 6 g/cm³ and volume 18 cm³. Find its mass.

Chapter 2: FR2 - Density and pressure

Q03 | 3 MARKS

A force of 240 N acts over 40 cm². Find the pressure.

Q04 | 3 MARKS

A material has mass 240 g and volume 40 cm³. Find its density.

Chapter 2: FR2 - Density and pressure

Q05 | 3 MARKS

A substance has density 5 g/cm³ and volume 27 cm³. Find its mass.

Q06 | 3 MARKS

A force of 220 N acts over 55 cm². Find the pressure.

Chapter 2: FR2 - Density and pressure

Q07 | 3 MARKS

A material has mass 220 g and volume 55 cm³. Find its density.

Q08 | 3 MARKS

A substance has density 4 g/cm³ and volume 36 cm³. Find its mass.

Chapter 2: FR2 - Density and pressure

Q09 | 3 MARKS

A force of 490 N acts over 70 cm². Find the pressure.

Q10 | 3 MARKS

A material has mass 140 g and volume 70 cm³. Find its density.

Chapter 2: FR2 - Density and pressure

Q11 | 3 MARKS

A substance has density 7 g/cm³ and volume 45 cm³. Find its mass.

Q12 | 3 MARKS

A force of 425 N acts over 85 cm². Find the pressure.

Worked solutions

Q01 | 3 MARKS

Density=mass÷volume=75÷25=3 g/cm³.

ANSWER: 3 g/cm³

Q02 | 3 MARKS

Mass=density x volume=6x18=108 g.

ANSWER: 108 g

Worked solutions

Q03 | 3 MARKS

Pressure=force÷area=240÷40=6 N/cm².

ANSWER: 6 N/cm²

Q04 | 3 MARKS

Density=mass÷volume=240÷40=6 g/cm³.

ANSWER: 6 g/cm³

Worked solutions

Q05 | 3 MARKS

Mass=density x volume=5x27=135 g.

ANSWER: 135 g

Q06 | 3 MARKS

Pressure=force÷area=220÷55=4 N/cm².

ANSWER: 4 N/cm²

Worked solutions

Q07 | 3 MARKS

Density=mass÷volume=220÷55=4 g/cm³.

ANSWER: 4 g/cm³

Q08 | 3 MARKS

Mass=density x volume=4x36=144 g.

ANSWER: 144 g

Worked solutions

Q09 | 3 MARKS

Pressure=force÷area=490÷70=7 N/cm².

ANSWER: 7 N/cm²

Q10 | 3 MARKS

Density=mass÷volume=140÷70=2 g/cm³.

ANSWER: 2 g/cm³

Worked solutions

Q11 | 3 MARKS

Mass=density x volume=7x45=315 g.

ANSWER: 315 g

Q12 | 3 MARKS

Pressure=force÷area=425÷85=5 N/cm².

ANSWER: 5 N/cm²

Chapter completion record

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12			

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FOUNDATION TIER

UNIT 3 | CHAPTER 3

FR3 - Scale drawings and maps

12 curated questions | complete solutions

Chapter focus

Use scale factors, scale diagrams and map scales.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 3: FR3 - Scale drawings and maps

Q01 | 2 MARKS

A drawing uses scale 1:3. A length is 5 cm on the drawing. Find the actual length.

Q02 | 3 MARKS

A map scale is 1:30000. Two points are 3 cm apart. Find the real distance in kilometres.

Chapter 3: FR3 - Scale drawings and maps

Q03 | 3 MARKS

An actual length of 45 m is represented by 5 cm. State the scale as 1:n using the same units.

Q04 | 2 MARKS

A drawing uses scale 1:6. A length is 8 cm on the drawing. Find the actual length.

Chapter 3: FR3 - Scale drawings and maps

Q05 | 3 MARKS

A map scale is 1:60000. Two points are 4.5 cm apart. Find the real distance in kilometres.

Q06 | 3 MARKS

An actual length of 60 m is represented by 5 cm. State the scale as 1:n using the same units.

Chapter 3: FR3 - Scale drawings and maps

Q07 | 2 MARKS

A drawing uses scale 1:9. A length is 11 cm on the drawing. Find the actual length.

Q08 | 3 MARKS

A map scale is 1:90000. Two points are 6 cm apart. Find the real distance in kilometres.

Chapter 3: FR3 - Scale drawings and maps

Q09 | 3 MARKS

An actual length of 75 m is represented by 5 cm. State the scale as 1:n using the same units.

Q10 | 2 MARKS

A drawing uses scale 1:12. A length is 14 cm on the drawing. Find the actual length.

Chapter 3: FR3 - Scale drawings and maps

Q11 | 3 MARKS

A map scale is 1:120000. Two points are 7.5 cm apart. Find the real distance in kilometres.

Q12 | 3 MARKS

An actual length of 90 m is represented by 5 cm. State the scale as 1:n using the same units.

Worked solutions

Q01 | 2 MARKS

Actual length=5x3=15 cm.

ANSWER: 15 cm

Q02 | 3 MARKS

Real distance=3x30000 cm=90000 cm=0.9 km.

ANSWER: 0.9 km

Worked solutions

Q03 | 3 MARKS

45 m=4500 cm. Divide both parts of 5:4500 by 5.

ANSWER: 1:900

Q04 | 2 MARKS

Actual length=8x6=48 cm.

ANSWER: 48 cm

Worked solutions

Q05 | 3 MARKS

Real distance=4.5x60000 cm=270000 cm=2.7 km.

ANSWER: 2.7 km

Q06 | 3 MARKS

60 m=6000 cm. Divide both parts of 5:6000 by 5.

ANSWER: 1:1200

Worked solutions

Q07 | 2 MARKS

Actual length=11x9=99 cm.

ANSWER: 99 cm

Q08 | 3 MARKS

Real distance=6x90000 cm=540000 cm=5.4 km.

ANSWER: 5.4 km

Worked solutions

Q09 | 3 MARKS

75 m=7500 cm. Divide both parts of 5:7500 by 5.

ANSWER: 1:1500

Q10 | 2 MARKS

Actual length=14x12=168 cm.

ANSWER: 168 cm

Worked solutions

Q11 | 3 MARKS

Real distance=7.5x120000 cm=900000 cm=9 km.

ANSWER: 9 km

Q12 | 3 MARKS

90 m=9000 cm. Divide both parts of 5:9000 by 5.

ANSWER: 1:1800

Chapter completion record

Question	Score / marks	Repair target	Retest date
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12			

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FOUNDATION TIER

UNIT 3 | CHAPTER 4

FR4 - One quantity as a fraction of another

12 curated questions | complete solutions

Chapter focus

Express one quantity as a fraction of another, including fractions greater than 1.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 4: FR4 - One quantity as a fraction of another

Q01 | 2 MARKS

Express 10 as a fraction of 15. Give the simplest form.

Q02 | 2 MARKS

Express 25 as a fraction of 18.

Chapter 4: FR4 - One quantity as a fraction of another

Q03 | 2 MARKS

Express 14 as a fraction of 21. Give the simplest form.

Q04 | 2 MARKS

Express 33 as a fraction of 24.

Chapter 4: FR4 - One quantity as a fraction of another

Q05 | 2 MARKS

Express 18 as a fraction of 27. Give the simplest form.

Q06 | 2 MARKS

Express 41 as a fraction of 30.

Chapter 4: FR4 - One quantity as a fraction of another

Q07 | 2 MARKS

Express 22 as a fraction of 33. Give the simplest form.

Q08 | 2 MARKS

Express 49 as a fraction of 36.

Chapter 4: FR4 - One quantity as a fraction of another

Q09 | 2 MARKS

Express 26 as a fraction of 39. Give the simplest form.

Q10 | 2 MARKS

Express 57 as a fraction of 42.

Chapter 4: FR4 - One quantity as a fraction of another

Q11 | 2 MARKS

Express 30 as a fraction of 45. Give the simplest form.

Q12 | 2 MARKS

Express 65 as a fraction of 48.

Worked solutions

Q01 | 2 MARKS

Write 10/15 and cancel the HCF to obtain 2/3.

ANSWER: 2/3

Q02 | 2 MARKS

The fraction may be greater than 1: 25/18=25/18.

ANSWER: 25/18

Worked solutions

Q03 | 2 MARKS

Write 14/21 and cancel the HCF to obtain 2/3.

ANSWER: 2/3

Q04 | 2 MARKS

The fraction may be greater than 1: 33/24=11/8.

ANSWER: 11/8

Worked solutions

Q05 | 2 MARKS

Write 18/27 and cancel the HCF to obtain 2/3.

ANSWER: 2/3

Q06 | 2 MARKS

The fraction may be greater than 1: 41/30=41/30.

ANSWER: 41/30

Worked solutions

Q07 | 2 MARKS

Write 22/33 and cancel the HCF to obtain 2/3.

ANSWER: 2/3

Q08 | 2 MARKS

The fraction may be greater than 1: 49/36=49/36.

ANSWER: 49/36

Worked solutions

Q09 | 2 MARKS

Write 26/39 and cancel the HCF to obtain 2/3.

ANSWER: 2/3

Q10 | 2 MARKS

The fraction may be greater than 1: 57/42=19/14.

ANSWER: 19/14

Worked solutions

Q11 | 2 MARKS

Write 30/45 and cancel the HCF to obtain 2/3.

ANSWER: 2/3

Q12 | 2 MARKS

The fraction may be greater than 1: 65/48=65/48.

ANSWER: 65/48

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 3 | CHAPTER 5

FR5 - Ratio notation and simplification

12 curated questions | complete solutions

Chapter focus

Use ratio notation and reduce ratios to simplest form.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 5: FR5 - Ratio notation and simplification

Q01 | 2 MARKS

Simplify the ratio 12:18.

Q02 | 2 MARKS

Simplify 18:27:9.

Chapter 5: FR5 - Ratio notation and simplification

Q03 | 3 MARKS

Simplify 3:12.

Q04 | 2 MARKS

Simplify the ratio 30:45.

Chapter 5: FR5 - Ratio notation and simplification

Q05 | 2 MARKS

Simplify 36:54:18.

Q06 | 3 MARKS

Simplify 4.5:21.

Chapter 5: FR5 - Ratio notation and simplification

Q07 | 2 MARKS

Simplify the ratio 48:72.

Q08 | 2 MARKS

Simplify 54:81:27.

Chapter 5: FR5 - Ratio notation and simplification

Q09 | 3 MARKS

Simplify 6:30.

Q10 | 2 MARKS

Simplify the ratio 66:99.

Chapter 5: FR5 - Ratio notation and simplification

Q11 | 2 MARKS

Simplify 72:108:36.

Q12 | 3 MARKS

Simplify 7.5:39.

Worked solutions

Q01 | 2 MARKS

Divide both parts by 6.

ANSWER: 2:3

Q02 | 2 MARKS

Divide all three parts by 9.

ANSWER: 2:3:1

Worked solutions

Q03 | 3 MARKS

Multiply both parts by 2 to remove the decimal, then divide by the HCF 6.

ANSWER: 1:4

Q04 | 2 MARKS

Divide both parts by 15.

ANSWER: 2:3

Worked solutions

Q05 | 2 MARKS

Divide all three parts by 18.

ANSWER: 2:3:1

Q06 | 3 MARKS

Multiply both parts by 2 to remove the decimal, then divide by the HCF 3.

ANSWER: 3:14

Worked solutions

Q07 | 2 MARKS

Divide both parts by 24.

ANSWER: 2:3

Q08 | 2 MARKS

Divide all three parts by 27.

ANSWER: 2:3:1

Worked solutions

Q09 | 3 MARKS

Multiply both parts by 2 to remove the decimal, then divide by the HCF 12.

ANSWER: 1:5

Q10 | 2 MARKS

Divide both parts by 33.

ANSWER: 2:3

Worked solutions

Q11 | 2 MARKS

Divide all three parts by 36.

ANSWER: 2:3:1

Q12 | 3 MARKS

Multiply both parts by 2 to remove the decimal, then divide by the HCF 3.

ANSWER: 5:26

Chapter completion record

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FOUNDATION TIER

UNIT 3 | CHAPTER 6

FR6 - Sharing and dividing in a ratio

12 curated questions | complete solutions

Chapter focus

Divide quantities into two or more parts and solve contextual ratio problems.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 6: FR6 - Sharing and dividing in a ratio

Q01 | 3 MARKS

Share £42 in the ratio 3:4.

Q02 | 3 MARKS

Divide 84 in the ratio 4:5:3.

Chapter 6: FR6 - Sharing and dividing in a ratio

Q03 | 3 MARKS

Two amounts are in the ratio 5:6. The larger amount is 48. Find the smaller amount.

Q04 | 3 MARKS

Share £81 in the ratio 2:7.

Chapter 6: FR6 - Sharing and dividing in a ratio

Q05 | 3 MARKS

Divide 90 in the ratio 3:3:3.

Q06 | 3 MARKS

Two amounts are in the ratio 4:4. The larger amount is 44. Find the smaller amount.

Chapter 6: FR6 - Sharing and dividing in a ratio

Q07 | 3 MARKS

Share £120 in the ratio 5:5.

Q08 | 3 MARKS

Divide 143 in the ratio 2:6:3.

Chapter 6: FR6 - Sharing and dividing in a ratio

Q09 | 3 MARKS

Two amounts are in the ratio 3:7. The larger amount is 98. Find the smaller amount.

Q10 | 3 MARKS

Share £105 in the ratio 4:3.

Chapter 6: FR6 - Sharing and dividing in a ratio

Q11 | 3 MARKS

Divide 192 in the ratio 5:4:3.

Q12 | 3 MARKS

Two amounts are in the ratio 2:5. The larger amount is 85. Find the smaller amount.

Worked solutions

Q01 | 3 MARKS

Total parts=7; one part=£42÷7=£6. Multiply by 3 and 4.

ANSWER: £18.00 and £24.00

Q02 | 3 MARKS

Total parts=12; one part=84÷12=7.

ANSWER: 28, 35, 21

Worked solutions

Q03 | 3 MARKS

The larger share has 6 parts, so one part=8; the smaller share is 5x8.

ANSWER: 40

Q04 | 3 MARKS

Total parts=9; one part=£81÷9=£9. Multiply by 2 and 7.

ANSWER: £18.00 and £63.00

Worked solutions

Q05 | 3 MARKS

Total parts=9; one part=90÷9=10.

ANSWER: 30, 30, 30

Q06 | 3 MARKS

The larger share has 4 parts, so one part=11; the smaller share is 4x11.

ANSWER: 44

Worked solutions

Q07 | 3 MARKS

Total parts=10; one part=£120÷10=£12. Multiply by 5 and 5.

ANSWER: £60.00 and £60.00

Q08 | 3 MARKS

Total parts=11; one part=143÷11=13.

ANSWER: 26, 78, 39

Worked solutions

Q09 | 3 MARKS

The larger share has 7 parts, so one part=14; the smaller share is 3x14.

ANSWER: 42

Q10 | 3 MARKS

Total parts=7; one part=£105÷7=£15. Multiply by 4 and 3.

ANSWER: £60.00 and £45.00

Worked solutions

Q11 | 3 MARKS

Total parts=12; one part=192÷12=16.

ANSWER: 80, 64, 48

Q12 | 3 MARKS

The larger share has 5 parts, so one part=17; the smaller share is 2x17.

ANSWER: 34

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 3 | CHAPTER 7

FR7 - Multiplicative relationships

12 curated questions | complete solutions

Chapter focus

Express multiplicative relationships as ratios or fractions.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 7: FR7 - Multiplicative relationships

Q01 | 2 MARKS

Quantity B is 3 times quantity A. Express A:B.

Q02 | 2 MARKS

A=5 and B=20. Express B as a fraction of A.

Chapter 7: FR7 - Multiplicative relationships

Q03 | 1 MARK

A:B=1:5. Complete the statement B = ___ x A.

Q04 | 2 MARKS

Quantity B is 6 times quantity A. Express A:B.

Chapter 7: FR7 - Multiplicative relationships

Q05 | 2 MARKS

A=8 and B=16. Express B as a fraction of A.

Q06 | 1 MARK

A:B=1:3. Complete the statement B = ___ x A.

Chapter 7: FR7 - Multiplicative relationships

Q07 | 2 MARKS

Quantity B is 4 times quantity A. Express A:B.

Q08 | 2 MARKS

A=11 and B=55. Express B as a fraction of A.

Chapter 7: FR7 - Multiplicative relationships

Q09 | 1 MARK

A:B=1:6. Complete the statement B = ___ x A.

Q10 | 2 MARKS

Quantity B is 2 times quantity A. Express A:B.

Chapter 7: FR7 - Multiplicative relationships

Q11 | 2 MARKS

A=14 and B=42. Express B as a fraction of A.

Q12 | 1 MARK

A:B=1:4. Complete the statement B = ___ x A.

Worked solutions

Q01 | 2 MARKS

For each 1 unit of A there are 3 units of B.

ANSWER: 1:3

Q02 | 2 MARKS

B/A=20/5=4.

ANSWER: 4

Worked solutions

Q03 | 1 MARK

The second quantity is 5 times the first.

ANSWER: 5

Q04 | 2 MARKS

For each 1 unit of A there are 6 units of B.

ANSWER: 1:6

Worked solutions

Q05 | 2 MARKS

B/A=16/8=2.

ANSWER: 2

Q06 | 1 MARK

The second quantity is 3 times the first.

ANSWER: 3

Worked solutions

Q07 | 2 MARKS

For each 1 unit of A there are 4 units of B.

ANSWER: 1:4

Q08 | 2 MARKS

B/A=55/11=5.

ANSWER: 5

Worked solutions

Q09 | 1 MARK

The second quantity is 6 times the first.

ANSWER: 6

Q10 | 2 MARKS

For each 1 unit of A there are 2 units of B.

ANSWER: 1:2

Worked solutions

Q11 | 2 MARKS

B/A=42/14=3.

ANSWER: 3

Q12 | 1 MARK

The second quantity is 4 times the first.

ANSWER: 4

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 3 | CHAPTER 8

FR8 - Proportion as equal ratios

12 curated questions | complete solutions

Chapter focus

Understand proportion as equality of ratios and find missing values.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 8: FR8 - Proportion as equal ratios

Q01 | 2 MARKS

3:4 = 12:x. Find x.

Q02 | 2 MARKS

4/5 = x/25. Find x.

Chapter 8: FR8 - Proportion as equal ratios

Q03 | 2 MARKS

Decide whether 5:6 and 30:36 are in proportion. Justify.

Q04 | 2 MARKS

6:7 = 42:x. Find x.

Chapter 8: FR8 - Proportion as equal ratios

Q05 | 2 MARKS

2/8 = x/64. Find x.

Q06 | 2 MARKS

Decide whether 3:3 and 27:27 are in proportion. Justify.

Chapter 8: FR8 - Proportion as equal ratios

Q07 | 2 MARKS

4:4 = 40:x. Find x.

Q08 | 2 MARKS

5/5 = x/55. Find x.

Chapter 8: FR8 - Proportion as equal ratios

Q09 | 2 MARKS

Decide whether 6:6 and 72:72 are in proportion. Justify.

Q10 | 2 MARKS

2:7 = 26:x. Find x.

Chapter 8: FR8 - Proportion as equal ratios

Q11 | 2 MARKS

3/8 = x/112. Find x.

Q12 | 2 MARKS

Decide whether 4:3 and 60:45 are in proportion. Justify.

Worked solutions

Q01 | 2 MARKS

The first part was multiplied by 4, so multiply the second part by 4.

ANSWER: 16

Q02 | 2 MARKS

The denominator was multiplied by 5; multiply the numerator by 5.

ANSWER: 20

Worked solutions

Q03 | 2 MARKS

Multiplying both parts of 5:6 by 6 gives 30:36.

ANSWER: Yes

Q04 | 2 MARKS

The first part was multiplied by 7, so multiply the second part by 7.

ANSWER: 49

Worked solutions

Q05 | 2 MARKS

The denominator was multiplied by 8; multiply the numerator by 8.

ANSWER: 16

Q06 | 2 MARKS

Multiplying both parts of 3:3 by 9 gives 27:27.

ANSWER: Yes

Worked solutions

Q07 | 2 MARKS

The first part was multiplied by 10, so multiply the second part by 10.

ANSWER: 40

Q08 | 2 MARKS

The denominator was multiplied by 11; multiply the numerator by 11.

ANSWER: 55

Worked solutions

Q09 | 2 MARKS

Multiplying both parts of 6:6 by 12 gives 72:72.

ANSWER: Yes

Q10 | 2 MARKS

The first part was multiplied by 13, so multiply the second part by 13.

ANSWER: 91

Worked solutions

Q11 | 2 MARKS

The denominator was multiplied by 14; multiply the numerator by 14.

ANSWER: 42

Q12 | 2 MARKS

Multiplying both parts of 4:3 by 15 gives 60:45.

ANSWER: Yes

Chapter completion record

Question	Score / marks	Repair target	Retest date
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12			

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FOUNDATION TIER

UNIT 3 | CHAPTER 9

FR9 - Ratios, fractions and linear functions

12 curated questions | complete solutions

Chapter focus

Connect ratios with fractions and simple linear relationships.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 9: FR9 - Ratios, fractions and linear functions

Q01 | 2 MARKS

In the ratio 3:4, what fraction of the total is the first part?

Q02 | 2 MARKS

y is 4 times x, then 6 is added. Write y as a function of x.

Chapter 9: FR9 - Ratios, fractions and linear functions

Q03 | 3 MARKS

A total of 99 is split in the ratio 5:6. Find the fraction and value of the first part.

Q04 | 2 MARKS

In the ratio 2:7, what fraction of the total is the first part?

Chapter 9: FR9 - Ratios, fractions and linear functions

Q05 | 2 MARKS

y is 7 times x, then 15 is added. Write y as a function of x.

Q06 | 3 MARKS

A total of 96 is split in the ratio 4:4. Find the fraction and value of the first part.

Chapter 9: FR9 - Ratios, fractions and linear functions

Q07 | 2 MARKS

In the ratio 5:5, what fraction of the total is the first part?

Q08 | 2 MARKS

y is 10 times x, then 24 is added. Write y as a function of x.

Chapter 9: FR9 - Ratios, fractions and linear functions

Q09 | 3 MARKS

A total of 150 is split in the ratio 3:7. Find the fraction and value of the first part.

Q10 | 2 MARKS

In the ratio 4:3, what fraction of the total is the first part?

Chapter 9: FR9 - Ratios, fractions and linear functions

Q11 | 2 MARKS

y is 13 times x, then 33 is added. Write y as a function of x.

Q12 | 3 MARKS

A total of 126 is split in the ratio 2:5. Find the fraction and value of the first part.

Worked solutions

Q01 | 2 MARKS

Total parts=7; first-part fraction=3/7.

ANSWER: 3/7

Q02 | 2 MARKS

Multiplication gives 4x; add 6.

ANSWER: y=4x+6

Worked solutions

Q03 | 3 MARKS

First fraction=5/11; one part=9, so first value=45.

ANSWER: 5/11 and 45

Q04 | 2 MARKS

Total parts=9; first-part fraction=2/9.

ANSWER: 2/9

Worked solutions

Q05 | 2 MARKS

Multiplication gives 7x; add 15.

ANSWER: y=7x+15

Q06 | 3 MARKS

First fraction=4/8; one part=12, so first value=48.

ANSWER: 4/8 and 48

Worked solutions

Q07 | 2 MARKS

Total parts=10; first-part fraction=5/10.

ANSWER: 5/10

Q08 | 2 MARKS

Multiplication gives 10x; add 24.

ANSWER: y=10x+24

Worked solutions

Q09 | 3 MARKS

First fraction=3/10; one part=15, so first value=45.

ANSWER: 3/10 and 45

Q10 | 2 MARKS

Total parts=7; first-part fraction=4/7.

ANSWER: 4/7

Worked solutions

Q11 | 2 MARKS

Multiplication gives 13x; add 33.

ANSWER: y=13x+33

Q12 | 3 MARKS

First fraction=2/7; one part=18, so first value=36.

ANSWER: 2/7 and 36

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 3 | CHAPTER 10

FR10 - Percentages and financial mathematics

12 curated questions | complete solutions

Chapter focus

Compare percentages and solve change, original value and simple-interest problems.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 10: FR10 - Percentages and financial mathematics

Q01 | 2 MARKS

Find 10% of £100.

Q02 | 3 MARKS

Increase £120 by 15%.

Chapter 10: FR10 - Percentages and financial mathematics

Q03 | 3 MARKS

After a 20% reduction, a price is £112.00. Find the original price.

Q04 | 3 MARKS

Find the simple interest on £160 at 25% per year for 2 years.

Chapter 10: FR10 - Percentages and financial mathematics

Q05 | 2 MARKS

Find 30% of £180.

Q06 | 3 MARKS

Increase £200 by 5%.

Chapter 10: FR10 - Percentages and financial mathematics

Q07 | 3 MARKS

After a 20% reduction, a price is £176.00. Find the original price.

Q08 | 3 MARKS

Find the simple interest on £240 at 15% per year for 2 years.

Chapter 10: FR10 - Percentages and financial mathematics

Q09 | 2 MARKS

Find 20% of £260.

Q10 | 3 MARKS

Increase £280 by 25%.

Chapter 10: FR10 - Percentages and financial mathematics

Q11 | 3 MARKS

After a 20% reduction, a price is £240.00. Find the original price.

Q12 | 3 MARKS

Find the simple interest on £320 at 5% per year for 2 years.

Worked solutions

Q01 | 2 MARKS

10/100 x £100=£10.00.

ANSWER: £10.00

Q02 | 3 MARKS

Use multiplier 1.15: £120x1.15=£138.00.

ANSWER: £138.00

Worked solutions

Q03 | 3 MARKS

The sale price is 80%; divide £112.00 by 0.8.

ANSWER: £140.00

Q04 | 3 MARKS

Annual interest=£160x25/100. Multiply by 2.

ANSWER: £80.00

Worked solutions

Q05 | 2 MARKS

30/100 x £180=£54.00.

ANSWER: £54.00

Q06 | 3 MARKS

Use multiplier 1.05: £200x1.05=£210.00.

ANSWER: £210.00

Worked solutions

Q07 | 3 MARKS

The sale price is 80%; divide £176.00 by 0.8.

ANSWER: £220.00

Q08 | 3 MARKS

Annual interest=£240x15/100. Multiply by 2.

ANSWER: £72.00

Worked solutions

Q09 | 2 MARKS

20/100 x £260=£52.00.

ANSWER: £52.00

Q10 | 3 MARKS

Use multiplier 1.25: £280x1.25=£350.00.

ANSWER: £350.00

Worked solutions

Q11 | 3 MARKS

The sale price is 80%; divide £240.00 by 0.8.

ANSWER: £300.00

Q12 | 3 MARKS

Annual interest=£320x5/100. Multiply by 2.

ANSWER: £32.00

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 3 | CHAPTER 11

FR11 - Direct and inverse proportion

12 curated questions | complete solutions

Chapter focus

Solve Foundation problems involving direct and inverse proportion.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

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Chapter 11: FR11 - Direct and inverse proportion

Q01 | 3 MARKS

y is directly proportional to x. When x=5, y=20. Find y when x=8.

Q02 | 3 MARKS

4 workers take 12 days. At the same rate, how long do 8 workers take?

Chapter 11: FR11 - Direct and inverse proportion

Q03 | 3 MARKS

6 identical packs cost £15.00. Find the cost of 10 packs.

Q04 | 3 MARKS

y is directly proportional to x. When x=8, y=56. Find y when x=11.

Chapter 11: FR11 - Direct and inverse proportion

Q05 | 3 MARKS

3 workers take 12 days. At the same rate, how long do 6 workers take?

Q06 | 3 MARKS

9 identical packs cost £22.50. Find the cost of 13 packs.

Chapter 11: FR11 - Direct and inverse proportion

Q07 | 3 MARKS

y is directly proportional to x. When x=11, y=110. Find y when x=14.

Q08 | 3 MARKS

2 workers take 12 days. At the same rate, how long do 4 workers take?

Chapter 11: FR11 - Direct and inverse proportion

Q09 | 3 MARKS

12 identical packs cost £30.00. Find the cost of 16 packs.

Q10 | 3 MARKS

y is directly proportional to x. When x=14, y=182. Find y when x=17.

Chapter 11: FR11 - Direct and inverse proportion

Q11 | 3 MARKS

5 workers take 12 days. At the same rate, how long do 10 workers take?

Q12 | 3 MARKS

15 identical packs cost £37.50. Find the cost of 19 packs.

Worked solutions

Q01 | 3 MARKS

y/x=4; use y=4x, giving 32.

ANSWER: 32

Q02 | 3 MARKS

Workers x days is constant: 4x12=48; divide by 8.

ANSWER: 6 days

Worked solutions

Q03 | 3 MARKS

Unit price=£15.00÷6=£2.50; multiply by 10.

ANSWER: £25.00

Q04 | 3 MARKS

y/x=7; use y=7x, giving 77.

ANSWER: 77

Worked solutions

Q05 | 3 MARKS

Workers x days is constant: 3x12=36; divide by 6.

ANSWER: 6 days

Q06 | 3 MARKS

Unit price=£22.50÷9=£2.50; multiply by 13.

ANSWER: £32.50

Worked solutions

Q07 | 3 MARKS

y/x=10; use y=10x, giving 140.

ANSWER: 140

Q08 | 3 MARKS

Workers x days is constant: 2x12=24; divide by 4.

ANSWER: 6 days

Worked solutions

Q09 | 3 MARKS

Unit price=£30.00÷12=£2.50; multiply by 16.

ANSWER: £40.00

Q10 | 3 MARKS

y/x=13; use y=13x, giving 221.

ANSWER: 221

Worked solutions

Q11 | 3 MARKS

Workers x days is constant: 5x12=60; divide by 10.

ANSWER: 6 days

Q12 | 3 MARKS

Unit price=£37.50÷15=£2.50; multiply by 19.

ANSWER: £47.50

Chapter completion record

Question	Score / marks	Repair target	Retest date
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3			
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FOUNDATION TIER

UNIT 3 | CHAPTER 12

FR12 - Compound units

12 curated questions | complete solutions

Chapter focus

Use speed, rates of pay, unit pricing, density and pressure.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

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Chapter 12: FR12 - Compound units

Q01 | 3 MARKS

Travel 175 km in 0.416667 hours. Find average speed.

Q02 | 2 MARKS

Work 5 hours at £10.50 per hour. Find the pay.

Chapter 12: FR12 - Compound units

Q03 | 3 MARKS

A 2.25 kg pack costs £7.50. Find the price per kilogram.

Q04 | 3 MARKS

A block has mass 260 g and volume 50 cm^3. Find density.

Chapter 12: FR12 - Compound units

Q05 | 3 MARKS

Travel 275 km in 0.75 hours. Find average speed.

Q06 | 2 MARKS

Work 9 hours at £13.50 per hour. Find the pay.

Chapter 12: FR12 - Compound units

Q07 | 3 MARKS

A 3.25 kg pack costs £9.50. Find the price per kilogram.

Q08 | 3 MARKS

A block has mass 340 g and volume 70 cm^3. Find density.

Chapter 12: FR12 - Compound units

Q09 | 3 MARKS

Travel 375 km in 1.08333 hours. Find average speed.

Q10 | 2 MARKS

Work 13 hours at £16.50 per hour. Find the pay.

Chapter 12: FR12 - Compound units

Q11 | 3 MARKS

A 4.25 kg pack costs £11.50. Find the price per kilogram.

Q12 | 3 MARKS

A block has mass 420 g and volume 90 cm^3. Find density.

Worked solutions

Q01 | 3 MARKS

Speed=distance÷time=175÷0.416667.

ANSWER: 420 km/h

Q02 | 2 MARKS

Pay=time x rate=5x£10.50=£52.50.

ANSWER: £52.50

Worked solutions

Q03 | 3 MARKS

Unit price=cost÷mass=£7.50÷2.25=£3.33 per kg.

ANSWER: £3.33

Q04 | 3 MARKS

Density=mass÷volume=260÷50=5.2 g/cm³.

ANSWER: 5.2 g/cm³

Worked solutions

Q05 | 3 MARKS

Speed=distance÷time=275÷0.75.

ANSWER: 366.667 km/h

Q06 | 2 MARKS

Pay=time x rate=9x£13.50=£121.50.

ANSWER: £121.50

Worked solutions

Q07 | 3 MARKS

Unit price=cost÷mass=£9.50÷3.25=£2.92 per kg.

ANSWER: £2.92

Q08 | 3 MARKS

Density=mass÷volume=340÷70=4.85714 g/cm³.

ANSWER: 4.85714 g/cm³

Worked solutions

Q09 | 3 MARKS

Speed=distance÷time=375÷1.08333.

ANSWER: 346.154 km/h

Q10 | 2 MARKS

Pay=time x rate=13x£16.50=£214.50.

ANSWER: £214.50

Worked solutions

Q11 | 3 MARKS

Unit price=cost÷mass=£11.50÷4.25=£2.71 per kg.

ANSWER: £2.71

Q12 | 3 MARKS

Density=mass÷volume=420÷90=4.66667 g/cm³.

ANSWER: 4.66667 g/cm³

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 3 | CHAPTER 13

FR13 - Scale factors for length, area and volume

12 curated questions | complete solutions

Chapter focus

Compare lengths, areas and volumes using ratio and scale factors.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 13: FR13 - Scale factors for length, area and volume

Q01 | 2 MARKS

Two similar lengths have scale factor 3. Write the ratio small:large.

Q02 | 3 MARKS

Two similar shapes have length scale factor 4. Find the area ratio small:large.

Chapter 13: FR13 - Scale factors for length, area and volume

Q03 | 3 MARKS

Two similar solids have length scale factor 5. Find the volume ratio small:large.

Q04 | 2 MARKS

Two similar lengths have scale factor 2. Write the ratio small:large.

Chapter 13: FR13 - Scale factors for length, area and volume

Q05 | 3 MARKS

Two similar shapes have length scale factor 3. Find the area ratio small:large.

Q06 | 3 MARKS

Two similar solids have length scale factor 4. Find the volume ratio small:large.

Chapter 13: FR13 - Scale factors for length, area and volume

Q07 | 2 MARKS

Two similar lengths have scale factor 5. Write the ratio small:large.

Q08 | 3 MARKS

Two similar shapes have length scale factor 2. Find the area ratio small:large.

Chapter 13: FR13 - Scale factors for length, area and volume

Q09 | 3 MARKS

Two similar solids have length scale factor 3. Find the volume ratio small:large.

Q10 | 2 MARKS

Two similar lengths have scale factor 4. Write the ratio small:large.

Chapter 13: FR13 - Scale factors for length, area and volume

Q11 | 3 MARKS

Two similar shapes have length scale factor 5. Find the area ratio small:large.

Q12 | 3 MARKS

Two similar solids have length scale factor 2. Find the volume ratio small:large.

Worked solutions

Q01 | 2 MARKS

Length ratio follows the scale factor directly.

ANSWER: 1:3

Q02 | 3 MARKS

Area scale factor=$4^2=16$.

ANSWER: 1:16

Worked solutions

Q03 | 3 MARKS

Volume scale factor=5^3=125.

ANSWER: 1:125

Q04 | 2 MARKS

Length ratio follows the scale factor directly.

ANSWER: 1:2

Worked solutions

Q05 | 3 MARKS

Area scale factor=$3^2=9$.

ANSWER: 1:9

Q06 | 3 MARKS

Volume scale factor=$4^3=64$.

ANSWER: 1:64

Worked solutions

Q07 | 2 MARKS

Length ratio follows the scale factor directly.

ANSWER: 1:5

Q08 | 3 MARKS

Area scale factor=$2^2=4$.

ANSWER: 1:4

Worked solutions

Q09 | 3 MARKS

Volume scale factor=3^3=27.

ANSWER: 1:27

Q10 | 2 MARKS

Length ratio follows the scale factor directly.

ANSWER: 1:4

Worked solutions

Q11 | 3 MARKS

Area scale factor=$5^2=25$.

ANSWER: 1:25

Q12 | 3 MARKS

Volume scale factor=$2^3=8$.

ANSWER: 1:8

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 3 | CHAPTER 14

FR14 - Equations for proportion

12 curated questions | complete solutions

Chapter focus

Interpret equations describing direct and inverse proportion.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 14: FR14 - Equations for proportion

Q01 | 2 MARKS

y=3x. State the type of proportion and constant of proportionality.

Q02 | 3 MARKS

y is directly proportional to x and y=16 when x=4. Find the equation.

Chapter 14: FR14 - Equations for proportion

Q03 | 2 MARKS

y=5/x. Find y when x=5 and name the proportion.

Q04 | 2 MARKS

y=6x. State the type of proportion and constant of proportionality.

Chapter 14: FR14 - Equations for proportion

Q05 | 3 MARKS

y is directly proportional to x and y=49 when x=7. Find the equation.

Q06 | 2 MARKS

y=8/x. Find y when x=8 and name the proportion.

Chapter 14: FR14 - Equations for proportion

Q07 | 2 MARKS

y=9x. State the type of proportion and constant of proportionality.

Q08 | 3 MARKS

y is directly proportional to x and y=100 when x=10. Find the equation.

Chapter 14: FR14 - Equations for proportion

Q09 | 2 MARKS

y=11/x. Find y when x=11 and name the proportion.

Q10 | 2 MARKS

y=12x. State the type of proportion and constant of proportionality.

Chapter 14: FR14 - Equations for proportion

Q11 | 3 MARKS

y is directly proportional to x and y=169 when x=13. Find the equation.

Q12 | 2 MARKS

y=14/x. Find y when x=14 and name the proportion.

Worked solutions

Q01 | 2 MARKS

The form y=kx represents direct proportion with k=3.

ANSWER: Direct proportion; 3

Q02 | 3 MARKS

k=y/x=16/4=4, so y=4x.

ANSWER: y=4x

Worked solutions

Q03 | 2 MARKS

Substitute x=5: y=5/5=1. The form y=k/x is inverse proportion.

ANSWER: 1; inverse proportion

Q04 | 2 MARKS

The form y=kx represents direct proportion with k=6.

ANSWER: Direct proportion; 6

Worked solutions

Q05 | 3 MARKS

k=y/x=49/7=7, so y=7x.

ANSWER: y=7x

Q06 | 2 MARKS

Substitute x=8: y=8/8=1. The form y=k/x is inverse proportion.

ANSWER: 1; inverse proportion

Worked solutions

Q07 | 2 MARKS

The form y=kx represents direct proportion with k=9.

ANSWER: Direct proportion; 9

Q08 | 3 MARKS

k=y/x=100/10=10, so y=10x.

ANSWER: y=10x

Worked solutions

Q09 | 2 MARKS

Substitute x=11: y=11/11=1. The form y=k/x is inverse proportion.

ANSWER: 1; inverse proportion

Q10 | 2 MARKS

The form y=kx represents direct proportion with k=12.

ANSWER: Direct proportion; 12

Worked solutions

Q11 | 3 MARKS

k=y/x=169/13=13, so y=13x.

ANSWER: y=13x

Q12 | 2 MARKS

Substitute x=14: y=14/14=1. The form y=k/x is inverse proportion.

ANSWER: 1; inverse proportion

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 3 | CHAPTER 15

FR15 - Rates of change and proportional graphs

12 curated questions | complete solutions

Chapter focus

Interpret straight-line gradient as a rate of change and recognise proportion graphs.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

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Chapter 15: FR15 - Rates of change and proportional graphs

Q01 | 2 MARKS

A straight-line graph rises by 15 units while moving 5 units right. Find its gradient.

Q02 | 2 MARKS

A tank fills at 4 litres per minute. Write the gradient of its volume-time graph with units.

Chapter 15: FR15 - Rates of change and proportional graphs

Q03 | 3 MARKS

A graph of y against x is a straight line through the origin and (7,35). Explain why y is directly proportional to x.

Q04 | 2 MARKS

A straight-line graph rises by 48 units while moving 8 units right. Find its gradient.

Chapter 15: FR15 - Rates of change and proportional graphs

Q05 | 2 MARKS

A tank fills at 7 litres per minute. Write the gradient of its volume-time graph with units.

Q06 | 3 MARKS

A graph of y against x is a straight line through the origin and (10,80). Explain why y is directly proportional to x.

Chapter 15: FR15 - Rates of change and proportional graphs

Q07 | 2 MARKS

A straight-line graph rises by 99 units while moving 11 units right. Find its gradient.

Q08 | 2 MARKS

A tank fills at 10 litres per minute. Write the gradient of its volume-time graph with units.

Chapter 15: FR15 - Rates of change and proportional graphs

Q09 | 3 MARKS

A graph of y against x is a straight line through the origin and (13,143). Explain why y is directly proportional to x.

Q10 | 2 MARKS

A straight-line graph rises by 168 units while moving 14 units right. Find its gradient.

Chapter 15: FR15 - Rates of change and proportional graphs

Q11 | 2 MARKS

A tank fills at 13 litres per minute. Write the gradient of its volume-time graph with units.

Q12 | 3 MARKS

A graph of y against x is a straight line through the origin and (16,224). Explain why y is directly proportional to x.

Worked solutions

Q01 | 2 MARKS

Gradient=rise/run=15/5=3.

ANSWER: 3

Q02 | 2 MARKS

Gradient is change in volume per unit time.

ANSWER: 4 litres/minute

Worked solutions

Q03 | 3 MARKS

The line is straight and passes through the origin; y=5x.

ANSWER: Gradient 5 and zero intercept

Q04 | 2 MARKS

Gradient=rise/run=48/8=6.

ANSWER: 6

Worked solutions

Q05 | 2 MARKS

Gradient is change in volume per unit time.

ANSWER: 7 litres/minute

Q06 | 3 MARKS

The line is straight and passes through the origin; y=8x.

ANSWER: Gradient 8 and zero intercept

Worked solutions

Q07 | 2 MARKS

Gradient=rise/run=99/11=9.

ANSWER: 9

Q08 | 2 MARKS

Gradient is change in volume per unit time.

ANSWER: 10 litres/minute

Worked solutions

Q09 | 3 MARKS

The line is straight and passes through the origin; y=11x.

ANSWER: Gradient 11 and zero intercept

Q10 | 2 MARKS

Gradient=rise/run=168/14=12.

ANSWER: 12

Worked solutions

Q11 | 2 MARKS

Gradient is change in volume per unit time.

ANSWER: 13 litres/minute

Q12 | 3 MARKS

The line is straight and passes through the origin; y=14x.

ANSWER: Gradient 14 and zero intercept

Chapter completion record

Question	Score / marks	Repair target	Retest date
1			
2			
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12			

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FOUNDATION TIER

UNIT 3 | CHAPTER 16

FR16 - Growth, decay and compound interest

12 curated questions | complete solutions

Chapter focus

Set up and interpret repeated-percentage growth and decay calculations.

Assessment progression

Questions 1-4 secure essential Foundation skills; Questions 5-8 connect representations; Questions 9-12 develop Grade 4-5 reasoning and interpretation.

Working expectation

Show every stage for questions worth 4 marks. For all other questions, write enough working for another student to follow your method.

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Chapter 16: FR16 - Growth, decay and compound interest

Q01 | 4 MARKS

You must show your working.

£125 grows by 3% each year for 3 years. Find the final amount.

Q02 | 4 MARKS

You must show your working.

A value of 150 decreases by 4% each year for 4 years. Find the final value.

Chapter 16: FR16 - Growth, decay and compound interest

Q03 | 4 MARKS

You must show your working.

A student adds 5% of 175 twice and claims compound growth gives £192.50. Calculate the correct two-year value.

Q04 | 4 MARKS

You must show your working.

£200 grows by 6% each year for 3 years. Find the final amount.

Chapter 16: FR16 - Growth, decay and compound interest

Q05 | 4 MARKS

You must show your working.

A value of 225 decreases by 7% each year for 4 years. Find the final value.

Q06 | 4 MARKS

You must show your working.

A student adds 8% of 250 twice and claims compound growth gives £290.00. Calculate the correct two-year value.

Chapter 16: FR16 - Growth, decay and compound interest

Q07 | 4 MARKS

You must show your working.

£275 grows by 2% each year for 3 years. Find the final amount.

Q08 | 4 MARKS

You must show your working.

A value of 300 decreases by 3% each year for 4 years. Find the final value.

Chapter 16: FR16 - Growth, decay and compound interest

Q09 | 4 MARKS

You must show your working.

A student adds 4% of 325 twice and claims compound growth gives £351.00. Calculate the correct two-year value.

Q10 | 4 MARKS

You must show your working.

£350 grows by 5% each year for 3 years. Find the final amount.

Chapter 16: FR16 - Growth, decay and compound interest

Q11 | 4 MARKS

You must show your working.

A value of 375 decreases by 6% each year for 4 years. Find the final value.

Q12 | 4 MARKS

You must show your working.

A student adds 7% of 400 twice and claims compound growth gives £456.00. Calculate the correct two-year value.

Worked solutions

Q01 | 4 MARKS

Use multiplier 1.03 repeatedly: £125x1.03^3=£136.59.

ANSWER: £136.59

Q02 | 4 MARKS

Use decay multiplier 0.96: 150x0.96^4=127.40.

ANSWER: 127.40

Worked solutions

Q03 | 4 MARKS

Compound growth acts on the new balance: $175 \times 1.05^2 = £192.94$.

ANSWER: £192.94

Q04 | 4 MARKS

Use multiplier 1.06 repeatedly: £200x1.06^3=£238.20.

ANSWER: £238.20

Worked solutions

Q05 | 4 MARKS

Use decay multiplier 0.93: 225x0.93^4=168.31.

ANSWER: 168.31

Q06 | 4 MARKS

Compound growth acts on the new balance: 250x1.08²=£291.60.

ANSWER: £291.60

Worked solutions

Q07 | 4 MARKS

Use multiplier 1.02 repeatedly: £275x1.02^3=£291.83.

ANSWER: £291.83

Q08 | 4 MARKS

Use decay multiplier 0.97: 300x0.97^4=265.59.

ANSWER: 265.59

Worked solutions

Q09 | 4 MARKS

Compound growth acts on the new balance: $325 \times 1.04^2 = £351.52$.

ANSWER: £351.52

Q10 | 4 MARKS

Use multiplier 1.05 repeatedly: £350x1.05^3=£405.17.

ANSWER: £405.17

Worked solutions

Q11 | 4 MARKS

Use decay multiplier 0.94: 375x0.94^4=292.78.

ANSWER: 292.78

Q12 | 4 MARKS

Compound growth acts on the new balance: 400x1.07²=£457.96.

ANSWER: £457.96

Chapter completion record

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1			
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