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GCSE MATHEMATICS FOUNDATION TIER

UNIT 4: GEOMETRY & MEASURES

21 chapters | 252 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	FG1 - Geometrical language and diagrams
2	FG2 - Constructions and loci
3	FG3 - Angle facts and polygons
4	FG4 - Triangles and quadrilaterals
5	FG5 - Triangle congruence
6	FG6 - Geometrical reasoning and Pythagoras
7	FG7 - Transformations and similarity
8	FG8 - Circle language
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15	FG15 - Circles and composite solids
16	FG16 - Arcs and sectors
17	FG17 - Congruence and similarity calculations
18	FG18 - Pythagoras and trigonometry
19	FG19 - Exact trigonometric values
20	FG20 - Translation vectors
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FOUNDATION TIER

UNIT 4 | CHAPTER 1

FG1 - Geometrical language and diagrams

12 curated questions | complete solutions

Chapter focus

Use conventional notation, identify symmetry and draw diagrams from descriptions.

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: FG1 - Geometrical language and diagrams

Q01 | 2 MARKS

A regular polygon has 4 sides. State its number of lines of symmetry.

Q02 | 2 MARKS

State the order of rotational symmetry of a regular 5-gon.

Chapter 1: FG1 - Geometrical language and diagrams

Q03 | 2 MARKS

Lines l3 and m3 meet at 90 degrees. Name their relationship and give the standard symbol.

Q04 | 2 MARKS

A polygon has 8 vertices. How many sides and edges does its boundary have?

Chapter 1: FG1 - Geometrical language and diagrams

Q05 | 2 MARKS

A regular polygon has 8 sides. State its number of lines of symmetry.

Q06 | 2 MARKS

State the order of rotational symmetry of a regular 9-gon.

Chapter 1: FG1 - Geometrical language and diagrams

Q07 | 2 MARKS

Lines l7 and m7 meet at 90 degrees. Name their relationship and give the standard symbol.

Q08 | 2 MARKS

A polygon has 12 vertices. How many sides and edges does its boundary have?

Chapter 1: FG1 - Geometrical language and diagrams

Q09 | 2 MARKS

A regular polygon has 12 sides. State its number of lines of symmetry.

Q10 | 2 MARKS

State the order of rotational symmetry of a regular 13-gon.

Chapter 1: FG1 - Geometrical language and diagrams

Q11 | 2 MARKS

Lines l_{11} and m_{11} meet at 90 degrees. Name their relationship and give the standard symbol.

Q12 | 2 MARKS

A polygon has 16 vertices. How many sides and edges does its boundary have?

Worked solutions

Q01 | 2 MARKS

A regular n -gon has n lines of reflection symmetry, so it has 4.

ANSWER: 4

Q02 | 2 MARKS

A regular n -gon maps onto itself n times in a full turn.

ANSWER: 5

Worked solutions

Q03 | 2 MARKS

Lines meeting at a right angle are perpendicular.

ANSWER: Perpendicular; l3 perpendicular to m3

Q04 | 2 MARKS

A polygon has equal numbers of vertices and sides.

ANSWER: 8 sides and 8 edges

Worked solutions

Q05 | 2 MARKS

A regular n -gon has n lines of reflection symmetry, so it has 8.

ANSWER: 8

Q06 | 2 MARKS

A regular n -gon maps onto itself n times in a full turn.

ANSWER: 9

Worked solutions

Q07 | 2 MARKS

Lines meeting at a right angle are perpendicular.

ANSWER: Perpendicular; l7 perpendicular to m7

Q08 | 2 MARKS

A polygon has equal numbers of vertices and sides.

ANSWER: 12 sides and 12 edges

Worked solutions

Q09 | 2 MARKS

A regular n -gon has n lines of reflection symmetry, so it has 12.

ANSWER: 12

Q10 | 2 MARKS

A regular n -gon maps onto itself n times in a full turn.

ANSWER: 13

Worked solutions

Q11 | 2 MARKS

Lines meeting at a right angle are perpendicular.

ANSWER: Perpendicular; l11 perpendicular to m11

Q12 | 2 MARKS

A polygon has equal numbers of vertices and sides.

ANSWER: 16 sides and 16 edges

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 2

FG2 - Constructions and loci

12 curated questions | complete solutions

Chapter focus

Use ruler-and-compass constructions and interpret loci and perpendicular distance.

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 2: FG2 - Constructions and loci

Q01 | 3 MARKS

Construct the perpendicular bisector of a line segment of length 4 cm. State one property of every point on it.

Q02 | 3 MARKS

Construct an angle of 50 degrees and bisect it. State the resulting angle.

Chapter 2: FG2 - Constructions and loci

Q03 | 2 MARKS

Describe the locus of points exactly 6 cm from a fixed point P.

Q04 | 3 MARKS

Construct the perpendicular bisector of a line segment of length 7 cm. State one property of every point on it.

Chapter 2: FG2 - Constructions and loci

Q05 | 3 MARKS

Construct an angle of 65 degrees and bisect it. State the resulting angle.

Q06 | 2 MARKS

Describe the locus of points exactly 9 cm from a fixed point P.

Chapter 2: FG2 - Constructions and loci

Q07 | 3 MARKS

Construct the perpendicular bisector of a line segment of length 10 cm. State one property of every point on it.

Q08 | 3 MARKS

Construct an angle of 80 degrees and bisect it. State the resulting angle.

Chapter 2: FG2 - Constructions and loci

Q09 | 2 MARKS

Describe the locus of points exactly 12 cm from a fixed point P.

Q10 | 3 MARKS

Construct the perpendicular bisector of a line segment of length 13 cm. State one property of every point on it.

Chapter 2: FG2 - Constructions and loci

Q11 | 3 MARKS

Construct an angle of 95 degrees and bisect it. State the resulting angle.

Q12 | 2 MARKS

Describe the locus of points exactly 15 cm from a fixed point P.

Worked solutions

Q01 | 3 MARKS

Use equal-radius arcs from both endpoints and join their intersections.

ANSWER: Points are equidistant from the endpoints

Q02 | 3 MARKS

Draw equal arcs from the arms and join the vertex to the arc intersection; halve the original angle.

ANSWER: 25 degrees

Worked solutions

Q03 | 2 MARKS

All points at a fixed distance from one point form a circle.

ANSWER: A circle centred at P with radius 6 cm

Q04 | 3 MARKS

Use equal-radius arcs from both endpoints and join their intersections.

ANSWER: Points are equidistant from the endpoints

Worked solutions

Q05 | 3 MARKS

Draw equal arcs from the arms and join the vertex to the arc intersection; halve the original angle.

ANSWER: 32.5 degrees

Q06 | 2 MARKS

All points at a fixed distance from one point form a circle.

ANSWER: A circle centred at P with radius 9 cm

Worked solutions

Q07 | 3 MARKS

Use equal-radius arcs from both endpoints and join their intersections.

ANSWER: Points are equidistant from the endpoints

Q08 | 3 MARKS

Draw equal arcs from the arms and join the vertex to the arc intersection; halve the original angle.

ANSWER: 40 degrees

Worked solutions

Q09 | 2 MARKS

All points at a fixed distance from one point form a circle.

ANSWER: A circle centred at P with radius 12 cm

Q10 | 3 MARKS

Use equal-radius arcs from both endpoints and join their intersections.

ANSWER: Points are equidistant from the endpoints

Worked solutions

Q11 | 3 MARKS

Draw equal arcs from the arms and join the vertex to the arc intersection; halve the original angle.

ANSWER: 47.5 degrees

Q12 | 2 MARKS

All points at a fixed distance from one point form a circle.

ANSWER: A circle centred at P with radius 15 cm

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 3

FG3 - Angle facts and polygons

12 curated questions | complete solutions

Chapter focus

Apply angle facts at points, on lines, in parallel lines, triangles and polygons.

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: FG3 - Angle facts and polygons

Q01 | 2 MARKS

Two angles on a straight line are 38 degrees and y degrees. Find y .

Q02 | 1 MARK

An angle is 49 degrees. Find its vertically opposite angle.

Chapter 3: FG3 - Angle facts and polygons

Q03 | 2 MARKS

Two angles of a triangle are 43 degrees and 58 degrees. Find the third.

Q04 | 2 MARKS

Find the sum of interior angles of a 9-sided polygon.

Chapter 3: FG3 - Angle facts and polygons

Q05 | 2 MARKS

Two angles on a straight line are 50 degrees and y degrees. Find y .

Q06 | 1 MARK

An angle is 57 degrees. Find its vertically opposite angle.

Chapter 3: FG3 - Angle facts and polygons

Q07 | 2 MARKS

Two angles of a triangle are 47 degrees and 62 degrees. Find the third.

Q08 | 2 MARKS

Find the sum of interior angles of a 13-sided polygon.

Chapter 3: FG3 - Angle facts and polygons

Q09 | 2 MARKS

Two angles on a straight line are 62 degrees and y degrees. Find y .

Q10 | 1 MARK

An angle is 65 degrees. Find its vertically opposite angle.

Chapter 3: FG3 - Angle facts and polygons

Q11 | 2 MARKS

Two angles of a triangle are 51 degrees and 66 degrees. Find the third.

Q12 | 2 MARKS

Find the sum of interior angles of a 17-sided polygon.

Worked solutions

Q01 | 2 MARKS

Angles on a straight line sum to 180 degrees: $y = 180 - 38$.

ANSWER: 142 degrees

Q02 | 1 MARK

Vertically opposite angles are equal.

ANSWER: 49 degrees

Worked solutions

Q03 | 2 MARKS

Triangle angles sum to 180 degrees: $180 - 43 - 58 = 79$.

ANSWER: 79 degrees

Q04 | 2 MARKS

Use $(n-2) \times 180 = (9-2) \times 180 = 1260$.

ANSWER: 1260 degrees

Worked solutions

Q05 | 2 MARKS

Angles on a straight line sum to 180 degrees: $y = 180 - 50$.

ANSWER: 130 degrees

Q06 | 1 MARK

Vertically opposite angles are equal.

ANSWER: 57 degrees

Worked solutions

Q07 | 2 MARKS

Triangle angles sum to 180 degrees: $180 - 47 - 62 = 71$.

ANSWER: 71 degrees**Q08 | 2 MARKS**

Use $(n-2) \times 180 = (13-2) \times 180 = 1980$.

ANSWER: 1980 degrees

Worked solutions

Q09 | 2 MARKS

Angles on a straight line sum to 180 degrees: $y = 180 - 62$.

ANSWER: 118 degrees

Q10 | 1 MARK

Vertically opposite angles are equal.

ANSWER: 65 degrees

Worked solutions

Q11 | 2 MARKS

Triangle angles sum to 180 degrees: $180 - 51 - 66 = 63$.

ANSWER: 63 degrees**Q12 | 2 MARKS**

Use $(n-2) \times 180 = (17-2) \times 180 = 2700$.

ANSWER: 2700 degrees

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 4

FG4 - Triangles and quadrilaterals

12 curated questions | complete solutions

Chapter focus

Use properties and definitions of special triangles, quadrilaterals and plane figures.

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: FG4 - Triangles and quadrilaterals

Q01 | 1 MARK

Quadrilateral Q1 has four equal sides and no requirement for right angles. Name its most specific family.

Q02 | 3 MARKS

A parallelogram has one side of 5 cm and an adjacent side of 7 cm. State the lengths of the two opposite sides and one angle property.

Chapter 4: FG4 - Triangles and quadrilaterals

Q03 | 3 MARKS

An isosceles triangle has vertex angle 46 degrees. Find each base angle.

Q04 | 3 MARKS

Rectangle R4 has side lengths 7 cm and 9 cm. Explain why it is not necessarily a square, although every square is a rectangle.

Chapter 4: FG4 - Triangles and quadrilaterals

Q05 | 1 MARK

Quadrilateral Q5 has four equal sides and no requirement for right angles. Name its most specific family.

Q06 | 3 MARKS

A parallelogram has one side of 9 cm and an adjacent side of 11 cm. State the lengths of the two opposite sides and one angle property.

Chapter 4: FG4 - Triangles and quadrilaterals

Q07 | 3 MARKS

An isosceles triangle has vertex angle 54 degrees. Find each base angle.

Q08 | 3 MARKS

Rectangle R8 has side lengths 11 cm and 13 cm. Explain why it is not necessarily a square, although every square is a rectangle.

Chapter 4: FG4 - Triangles and quadrilaterals

Q09 | 1 MARK

Quadrilateral Q9 has four equal sides and no requirement for right angles. Name its most specific family.

Q10 | 3 MARKS

A parallelogram has one side of 13 cm and an adjacent side of 15 cm. State the lengths of the two opposite sides and one angle property.

Chapter 4: FG4 - Triangles and quadrilaterals

Q11 | 3 MARKS

An isosceles triangle has vertex angle 62 degrees. Find each base angle.

Q12 | 3 MARKS

Rectangle R12 has side lengths 15 cm and 17 cm. Explain why it is not necessarily a square, although every square is a rectangle.

Worked solutions

Q01 | 1 MARK

A rhombus is defined by four equal sides.

ANSWER: Rhombus

Q02 | 3 MARKS

Opposite sides of a parallelogram are equal and parallel, and opposite angles are equal.

ANSWER: 5 cm and 7 cm; opposite angles are equal

Worked solutions

Q03 | 3 MARKS

The equal base angles share $180-46=134$ degrees.

ANSWER: 67 degrees

Q04 | 3 MARKS

A square satisfies the rectangle definition and additionally has four equal sides.

ANSWER: Its adjacent sides need not be equal; both rectangles and squares have four right angles

Worked solutions

Q05 | 1 MARK

A rhombus is defined by four equal sides.

ANSWER: Rhombus

Q06 | 3 MARKS

Opposite sides of a parallelogram are equal and parallel, and opposite angles are equal.

ANSWER: 9 cm and 11 cm; opposite angles are equal

Worked solutions

Q07 | 3 MARKS

The equal base angles share $180-54=126$ degrees.

ANSWER: 63 degrees

Q08 | 3 MARKS

A square satisfies the rectangle definition and additionally has four equal sides.

ANSWER: Its adjacent sides need not be equal; both rectangles and squares have four right angles

Worked solutions

Q09 | 1 MARK

A rhombus is defined by four equal sides.

ANSWER: Rhombus

Q10 | 3 MARKS

Opposite sides of a parallelogram are equal and parallel, and opposite angles are equal.

ANSWER: 13 cm and 15 cm; opposite angles are equal

Worked solutions

Q11 | 3 MARKS

The equal base angles share $180-62=118$ degrees.

ANSWER: 59 degrees

Q12 | 3 MARKS

A square satisfies the rectangle definition and additionally has four equal sides.

ANSWER: Its adjacent sides need not be equal; both rectangles and squares have four right angles

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 5

FG5 - Triangle congruence

12 curated questions | complete solutions

Chapter focus

Use SSS, SAS, ASA and RHS congruence criteria.

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: FG5 - Triangle congruence

Q01 | 3 MARKS

Triangles A1 and B1 have three corresponding sides are equal. State the congruence criterion and say what congruent means.

Q02 | 3 MARKS

Triangles A2 and B2 have two sides and the included angle are equal. State the congruence criterion and say what congruent means.

Chapter 5: FG5 - Triangle congruence

Q03 | 3 MARKS

Triangles A3 and B3 have two angles and a corresponding side are equal. State the congruence criterion and say what congruent means.

Q04 | 3 MARKS

Triangles A4 and B4 have right angle, hypotenuse and one side are equal. State the congruence criterion and say what congruent means.

Chapter 5: FG5 - Triangle congruence

Q05 | 3 MARKS

Triangles A5 and B5 have three corresponding sides are equal. State the congruence criterion and say what congruent means.

Q06 | 3 MARKS

Triangles A6 and B6 have two sides and the included angle are equal. State the congruence criterion and say what congruent means.

Chapter 5: FG5 - Triangle congruence

Q07 | 3 MARKS

Triangles A7 and B7 have two angles and a corresponding side are equal. State the congruence criterion and say what congruent means.

Q08 | 3 MARKS

Triangles A8 and B8 have right angle, hypotenuse and one side are equal. State the congruence criterion and say what congruent means.

Chapter 5: FG5 - Triangle congruence

Q09 | 3 MARKS

Triangles A9 and B9 have three corresponding sides are equal. State the congruence criterion and say what congruent means.

Q10 | 3 MARKS

Triangles A10 and B10 have two sides and the included angle are equal. State the congruence criterion and say what congruent means.

Chapter 5: FG5 - Triangle congruence

Q11 | 3 MARKS

Triangles A11 and B11 have two angles and a corresponding side are equal. State the congruence criterion and say what congruent means.

Q12 | 3 MARKS

Triangles A12 and B12 have right angle, hypotenuse and one side are equal. State the congruence criterion and say what congruent means.

Worked solutions

Q01 | 3 MARKS

This matches the SSS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: SSS; identical in size and shape

Q02 | 3 MARKS

This matches the SAS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: SAS; identical in size and shape

Worked solutions

Q03 | 3 MARKS

This matches the ASA condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: ASA; identical in size and shape

Q04 | 3 MARKS

This matches the RHS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: RHS; identical in size and shape

Worked solutions

Q05 | 3 MARKS

This matches the SSS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: SSS; identical in size and shape

Q06 | 3 MARKS

This matches the SAS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: SAS; identical in size and shape

Worked solutions

Q07 | 3 MARKS

This matches the ASA condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: ASA; identical in size and shape

Q08 | 3 MARKS

This matches the RHS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: RHS; identical in size and shape

Worked solutions

Q09 | 3 MARKS

This matches the SSS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: SSS; identical in size and shape

Q10 | 3 MARKS

This matches the SAS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: SAS; identical in size and shape

Worked solutions

Q11 | 3 MARKS

This matches the ASA condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: ASA; identical in size and shape

Q12 | 3 MARKS

This matches the RHS condition. Congruent triangles have all corresponding sides and angles equal.

ANSWER: RHS; identical in size and shape

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 6

FG6 - Geometrical reasoning and Pythagoras

12 curated questions | complete solutions

Chapter focus

Combine angle, congruence, similarity and Pythagoras facts in simple proofs.

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: FG6 - Geometrical reasoning and Pythagoras

Q01 | 3 MARKS

A right triangle has shorter sides 4 cm and 5 cm. Find the hypotenuse.

Q02 | 3 MARKS

An isosceles triangle has one base angle 44 degrees. Find the other two angles and justify.

Chapter 6: FG6 - Geometrical reasoning and Pythagoras

Q03 | 2 MARKS

Triangles P3 and Q3 are congruent by SAS. A third side of P3 is 6 cm. State the corresponding side of Q3 and justify.

Q04 | 3 MARKS

A right triangle has shorter sides 7 cm and 8 cm. Find the hypotenuse.

Chapter 6: FG6 - Geometrical reasoning and Pythagoras

Q05 | 3 MARKS

An isosceles triangle has one base angle 47 degrees. Find the other two angles and justify.

Q06 | 2 MARKS

Triangles P6 and Q6 are congruent by SAS. A third side of P6 is 9 cm. State the corresponding side of Q6 and justify.

Chapter 6: FG6 - Geometrical reasoning and Pythagoras

Q07 | 3 MARKS

A right triangle has shorter sides 10 cm and 11 cm. Find the hypotenuse.

Q08 | 3 MARKS

An isosceles triangle has one base angle 50 degrees. Find the other two angles and justify.

Chapter 6: FG6 - Geometrical reasoning and Pythagoras

Q09 | 2 MARKS

Triangles P9 and Q9 are congruent by SAS. A third side of P9 is 12 cm. State the corresponding side of Q9 and justify.

Q10 | 3 MARKS

A right triangle has shorter sides 13 cm and 14 cm. Find the hypotenuse.

Chapter 6: FG6 - Geometrical reasoning and Pythagoras

Q11 | 3 MARKS

An isosceles triangle has one base angle 53 degrees. Find the other two angles and justify.

Q12 | 2 MARKS

Triangles P12 and Q12 are congruent by SAS. A third side of P12 is 15 cm. State the corresponding side of Q12 and justify.

Worked solutions

Q01 | 3 MARKS

$$c = \sqrt{4^2 + 5^2} = \sqrt{41} = 6.40 \text{ cm.}$$

ANSWER: 6.40 cm**Q02 | 3 MARKS**

Base angles are equal; the vertex angle is $180 - 2 \times 44 = 92$ degrees.

ANSWER: 44 degrees and 92 degrees

Worked solutions

Q03 | 2 MARKS

Congruent triangles are identical in size and shape, so corresponding sides are equal.

ANSWER: 6 cm

Q04 | 3 MARKS

$$c = \sqrt{7^2 + 8^2} = \sqrt{113} = 10.63 \text{ cm.}$$

ANSWER: 10.63 cm

Worked solutions

Q05 | 3 MARKS

Base angles are equal; the vertex angle is $180 - 2 \times 47 = 86$ degrees.

ANSWER: 47 degrees and 86 degrees

Q06 | 2 MARKS

Congruent triangles are identical in size and shape, so corresponding sides are equal.

ANSWER: 9 cm

Worked solutions

Q07 | 3 MARKS

$$c = \sqrt{10^2 + 11^2} = \sqrt{221} = 14.87 \text{ cm.}$$

ANSWER: 14.87 cm**Q08 | 3 MARKS**

Base angles are equal; the vertex angle is $180 - 2 \times 50 = 80$ degrees.

ANSWER: 50 degrees and 80 degrees

Worked solutions

Q09 | 2 MARKS

Congruent triangles are identical in size and shape, so corresponding sides are equal.

ANSWER: 12 cm**Q10 | 3 MARKS**

$$c = \sqrt{13^2 + 14^2} = \sqrt{365} = 19.10 \text{ cm.}$$

ANSWER: 19.10 cm

Worked solutions

Q11 | 3 MARKS

Base angles are equal; the vertex angle is $180 - 2 \times 53 = 74$ degrees.

ANSWER: 53 degrees and 74 degrees

Q12 | 2 MARKS

Congruent triangles are identical in size and shape, so corresponding sides are equal.

ANSWER: 15 cm

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 7

FG7 - Transformations and similarity

12 curated questions | complete solutions

Chapter focus

Describe and construct rotations, reflections, translations and enlargements.

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: FG7 - Transformations and similarity

Q01 | 2 MARKS

Point (1,4) is translated by vector (6, -1). Find its image.

Q02 | 2 MARKS

Reflect (2,5) in the y-axis.

Chapter 7: FG7 - Transformations and similarity

Q03 | 2 MARKS

Rotate (3,6) 180 degrees about the origin.

Q04 | 3 MARKS

Enlarge (8,14) from the origin by scale factor $\frac{3}{2}$.

Chapter 7: FG7 - Transformations and similarity

Q05 | 2 MARKS

Point (5,8) is translated by vector (10, -5). Find its image.

Q06 | 2 MARKS

Reflect (6,9) in the y-axis.

Chapter 7: FG7 - Transformations and similarity

Q07 | 2 MARKS

Rotate (7,10) 180 degrees about the origin.

Q08 | 3 MARKS

Enlarge (16,22) from the origin by scale factor $\frac{3}{2}$.

Chapter 7: FG7 - Transformations and similarity

Q09 | 2 MARKS

Point (9,12) is translated by vector (14, -9). Find its image.

Q10 | 2 MARKS

Reflect (10,13) in the y-axis.

Chapter 7: FG7 - Transformations and similarity

Q11 | 2 MARKS

Rotate (11,14) 180 degrees about the origin.

Q12 | 3 MARKS

Enlarge (24,30) from the origin by scale factor $\frac{3}{2}$.

Worked solutions

Q01 | 2 MARKS

Add the vector components: $(1+6, 4+(-1))$.

ANSWER: $(7, 3)$ **Q02 | 2 MARKS**

Reflection in the y-axis changes the sign of x only.

ANSWER: $(-2, 5)$

Worked solutions

Q03 | 2 MARKS

A half-turn maps (x,y) to $(-x,-y)$.

ANSWER: $(-3,-6)$

Q04 | 3 MARKS

Multiply both coordinates by $3/2$.

ANSWER: $(12,21)$

Worked solutions

Q05 | 2 MARKS

Add the vector components: $(5+10, 8+(-5))$.

ANSWER: $(15, 3)$

Q06 | 2 MARKS

Reflection in the y-axis changes the sign of x only.

ANSWER: $(-6, 9)$

Worked solutions

Q07 | 2 MARKS

A half-turn maps (x,y) to $(-x,-y)$.

ANSWER: $(-7,-10)$

Q08 | 3 MARKS

Multiply both coordinates by $3/2$.

ANSWER: $(24,33)$

Worked solutions

Q09 | 2 MARKS

Add the vector components: $(9+14, 12+(-9))$.

ANSWER: (23,3)**Q10 | 2 MARKS**

Reflection in the y-axis changes the sign of x only.

ANSWER: (-10,13)

Worked solutions

Q11 | 2 MARKS

A half-turn maps (x,y) to $(-x,-y)$.

ANSWER: $(-11,-14)$ **Q12 | 3 MARKS**

Multiply both coordinates by $3/2$.

ANSWER: $(36,45)$

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 8

FG8 - Circle language

12 curated questions | complete solutions

Chapter focus

Identify and apply centre, radius, chord, diameter, circumference, tangent, arc, sector and segment.

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: FG8 - Circle language

Q01 | 1 MARK

In circle C1, name the feature described as a line from centre to circumference.

Q02 | 1 MARK

In circle C2, name the feature described as a line through centre joining two circumference points.

Chapter 8: FG8 - Circle language

Q03 | 1 MARK

In circle C3, name the feature described as a line joining two circumference points.

Q04 | 1 MARK

In circle C4, name the feature described as a line touching a circle once.

Chapter 8: FG8 - Circle language

Q05 | 1 MARK

In circle C5, name the feature described as a part of the circumference.

Q06 | 1 MARK

In circle C6, name the feature described as a region between two radii and an arc.

Chapter 8: FG8 - Circle language

Q07 | 1 MARK

In circle C7, name the feature described as a line from centre to circumference.

Q08 | 1 MARK

In circle C8, name the feature described as a line through centre joining two circumference points.

Chapter 8: FG8 - Circle language

Q09 | 1 MARK

In circle C9, name the feature described as a line joining two circumference points.

Q10 | 1 MARK

In circle C10, name the feature described as a line touching a circle once.

Chapter 8: FG8 - Circle language

Q11 | 1 MARK

In circle C11, name the feature described as a part of the circumference.

Q12 | 1 MARK

In circle C12, name the feature described as a region between two radii and an arc.

Worked solutions

Q01 | 1 MARK

This is the definition of a radius.

ANSWER: Radius

Q02 | 1 MARK

This is the definition of a diameter.

ANSWER: Diameter

Worked solutions

Q03 | 1 MARK

This is the definition of a chord.

ANSWER: Chord

Q04 | 1 MARK

This is the definition of a tangent.

ANSWER: Tangent

Worked solutions

Q05 | 1 MARK

This is the definition of a arc.

ANSWER: Arc

Q06 | 1 MARK

This is the definition of a sector.

ANSWER: Sector

Worked solutions

Q07 | 1 MARK

This is the definition of a radius.

ANSWER: Radius

Q08 | 1 MARK

This is the definition of a diameter.

ANSWER: Diameter

Worked solutions

Q09 | 1 MARK

This is the definition of a chord.

ANSWER: Chord

Q10 | 1 MARK

This is the definition of a tangent.

ANSWER: Tangent

Worked solutions

Q11 | 1 MARK

This is the definition of a arc.

ANSWER: Arc

Q12 | 1 MARK

This is the definition of a sector.

ANSWER: Sector

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 9

FG9 - Coordinate geometry

12 curated questions | complete solutions

Chapter focus

Solve geometrical problems using coordinates.

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: FG9 - Coordinate geometry

Q01 | 2 MARKS

Find the midpoint of (1,4) and (7,8).

Q02 | 2 MARKS

Find the distance between (2,5) and (2,12).

Chapter 9: FG9 - Coordinate geometry

Q03 | 2 MARKS

Three vertices of a rectangle are $(0,0)$, $(6,0)$, and $(6,8)$. Find the fourth vertex.

Q04 | 2 MARKS

Find the midpoint of $(4,7)$ and $(10,11)$.

Chapter 9: FG9 - Coordinate geometry

Q05 | 2 MARKS

Find the distance between (5,8) and (5,15).

Q06 | 2 MARKS

Three vertices of a rectangle are (0,0), (9,0), and (9,11). Find the fourth vertex.

Chapter 9: FG9 - Coordinate geometry

Q07 | 2 MARKS

Find the midpoint of (7,10) and (13,14).

Q08 | 2 MARKS

Find the distance between (8,11) and (8,18).

Chapter 9: FG9 - Coordinate geometry

Q09 | 2 MARKS

Three vertices of a rectangle are $(0,0)$, $(12,0)$, and $(12,14)$. Find the fourth vertex.

Q10 | 2 MARKS

Find the midpoint of $(10,13)$ and $(16,17)$.

Chapter 9: FG9 - Coordinate geometry

Q11 | 2 MARKS

Find the distance between (11,14) and (11,21).

Q12 | 2 MARKS

Three vertices of a rectangle are (0,0), (15,0), and (15,17). Find the fourth vertex.

Worked solutions

Q01 | 2 MARKS

Average corresponding coordinates.

ANSWER: (4,6)**Q02 | 2 MARKS**

The x-coordinates are equal, so use the difference in y-values.

ANSWER: 7 units

Worked solutions

Q03 | 2 MARKS

Opposite sides are parallel to the coordinate axes.

ANSWER: (0,8)

Q04 | 2 MARKS

Average corresponding coordinates.

ANSWER: (7,9)

Worked solutions

Q05 | 2 MARKS

The x-coordinates are equal, so use the difference in y-values.

ANSWER: 7 units

Q06 | 2 MARKS

Opposite sides are parallel to the coordinate axes.

ANSWER: (0,11)

Worked solutions

Q07 | 2 MARKS

Average corresponding coordinates.

ANSWER: (10,12)

Q08 | 2 MARKS

The x-coordinates are equal, so use the difference in y-values.

ANSWER: 7 units

Worked solutions

Q09 | 2 MARKS

Opposite sides are parallel to the coordinate axes.

ANSWER: (0,14)

Q10 | 2 MARKS

Average corresponding coordinates.

ANSWER: (13,15)

Worked solutions

Q11 | 2 MARKS

The x-coordinates are equal, so use the difference in y-values.

ANSWER: 7 units

Q12 | 2 MARKS

Opposite sides are parallel to the coordinate axes.

ANSWER: (0,17)

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 10

FG10 - Properties of 3D shapes

12 curated questions | complete solutions

Chapter focus

Identify faces, surfaces, edges and vertices of common solids.

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: FG10 - Properties of 3D shapes

Q01 | 3 MARKS

State the numbers of faces or surfaces, edges and vertices of a cube.

Q02 | 3 MARKS

State the numbers of faces or surfaces, edges and vertices of a cuboid.

Chapter 10: FG10 - Properties of 3D shapes

Q03 | 3 MARKS

State the numbers of faces or surfaces, edges and vertices of a triangular prism.

Q04 | 3 MARKS

State the numbers of faces or surfaces, edges and vertices of a square-based pyramid.

Chapter 10: FG10 - Properties of 3D shapes

Q05 | 3 MARKS

State the numbers of faces or surfaces, edges and vertices of a cylinder.

Q06 | 3 MARKS

State the numbers of faces or surfaces, edges and vertices of a cone.

Chapter 10: FG10 - Properties of 3D shapes

Q07 | 4 MARKS

You must show your working.

A model is a cube. Count its faces or surfaces, edges and vertices, then describe one face or curved surface it contains.

Q08 | 4 MARKS

You must show your working.

A model is a cuboid. Count its faces or surfaces, edges and vertices, then describe one face or curved surface it contains.

Chapter 10: FG10 - Properties of 3D shapes

Q09 | 4 MARKS

You must show your working.

A model is a triangular prism. Count its faces or surfaces, edges and vertices, then describe one face or curved surface it contains.

Q10 | 4 MARKS

You must show your working.

A model is a square-based pyramid. Count its faces or surfaces, edges and vertices, then describe one face or curved surface it contains.

Chapter 10: FG10 - Properties of 3D shapes

Q11 | 4 MARKS

You must show your working.

A model is a cylinder. Count its faces or surfaces, edges and vertices, then describe one face or curved surface it contains.

Q12 | 4 MARKS

You must show your working.

A model is a cone. Count its faces or surfaces, edges and vertices, then describe one face or curved surface it contains.

Worked solutions

Q01 | 3 MARKS

Use a model or net and count each feature once.

ANSWER: 6 faces, 12 edges, 8 vertices

Q02 | 3 MARKS

Use a model or net and count each feature once.

ANSWER: 6 faces, 12 edges, 8 vertices

Worked solutions

Q03 | 3 MARKS

Use a model or net and count each feature once.

ANSWER: 5 faces, 9 edges, 6 vertices

Q04 | 3 MARKS

Use a model or net and count each feature once.

ANSWER: 5 faces, 8 edges, 5 vertices

Worked solutions

Q05 | 3 MARKS

Use a model or net and count each feature once.

ANSWER: 3 surfaces, 2 circular edges, 0 vertices

Q06 | 3 MARKS

Use a model or net and count each feature once.

ANSWER: 2 surfaces, 1 circular edge, 1 vertex

Worked solutions

Q07 | 4 MARKS

Count each feature once, then identify a valid face or curved surface of the cube.

ANSWER: 6 faces, 12 edges, 8 vertices; suitable face/surface description

Q08 | 4 MARKS

Count each feature once, then identify a valid face or curved surface of the cuboid.

ANSWER: 6 faces, 12 edges, 8 vertices; suitable face/surface description

Worked solutions

Q09 | 4 MARKS

Count each feature once, then identify a valid face or curved surface of the triangular prism.

ANSWER: 5 faces, 9 edges, 6 vertices; suitable face/surface description

Q10 | 4 MARKS

Count each feature once, then identify a valid face or curved surface of the square-based pyramid.

ANSWER: 5 faces, 8 edges, 5 vertices; suitable face/surface description

Worked solutions

Q11 | 4 MARKS

Count each feature once, then identify a valid face or curved surface of the cylinder.

ANSWER: 3 surfaces, 2 circular edges, 0 vertices; suitable face/surface description

Q12 | 4 MARKS

Count each feature once, then identify a valid face or curved surface of the cone.

ANSWER: 2 surfaces, 1 circular edge, 1 vertex; suitable face/surface description

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 11

FG11 - Plans and elevations

12 curated questions | complete solutions

Chapter focus

Construct and interpret plans and elevations of 3D shapes.

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 11: FG11 - Plans and elevations

Q01 | 2 MARKS

A stack is 4 cubes long, 2 cubes wide and 1 cube high. Describe its plan view dimensions.

Q02 | 2 MARKS

A cuboid is 5 cm long, 7 cm wide and 4 cm high. Give the front elevation if the front shows length and height.

Chapter 11: FG11 - Plans and elevations

Q03 | 2 MARKS

A solid has plan view 6 by 8 and constant height 5. State the side elevation dimensions.

Q04 | 2 MARKS

A stack is 7 cubes long, 2 cubes wide and 1 cube high. Describe its plan view dimensions.

Chapter 11: FG11 - Plans and elevations

Q05 | 2 MARKS

A cuboid is 8 cm long, 10 cm wide and 7 cm high. Give the front elevation if the front shows length and height.

Q06 | 2 MARKS

A solid has plan view 9 by 11 and constant height 8. State the side elevation dimensions.

Chapter 11: FG11 - Plans and elevations

Q07 | 2 MARKS

A stack is 10 cubes long, 2 cubes wide and 1 cube high. Describe its plan view dimensions.

Q08 | 2 MARKS

A cuboid is 11 cm long, 13 cm wide and 10 cm high. Give the front elevation if the front shows length and height.

Chapter 11: FG11 - Plans and elevations

Q09 | 2 MARKS

A solid has plan view 12 by 14 and constant height 11. State the side elevation dimensions.

Q10 | 2 MARKS

A stack is 13 cubes long, 2 cubes wide and 1 cube high. Describe its plan view dimensions.

Chapter 11: FG11 - Plans and elevations

Q11 | 2 MARKS

A cuboid is 14 cm long, 16 cm wide and 13 cm high. Give the front elevation if the front shows length and height.

Q12 | 2 MARKS

A solid has plan view 15 by 17 and constant height 14. State the side elevation dimensions.

Worked solutions

Q01 | 2 MARKS

The plan is the view from above, so height is hidden.

ANSWER: 4 by 2 squares

Q02 | 2 MARKS

A front elevation shows horizontal length and vertical height.

ANSWER: 5 cm by 4 cm rectangle

Worked solutions

Q03 | 2 MARKS

From the side, width and height are visible.

ANSWER: 8 by 5

Q04 | 2 MARKS

The plan is the view from above, so height is hidden.

ANSWER: 7 by 2 squares

Worked solutions

Q05 | 2 MARKS

A front elevation shows horizontal length and vertical height.

ANSWER: 8 cm by 7 cm rectangle

Q06 | 2 MARKS

From the side, width and height are visible.

ANSWER: 11 by 8

Worked solutions

Q07 | 2 MARKS

The plan is the view from above, so height is hidden.

ANSWER: 10 by 2 squares

Q08 | 2 MARKS

A front elevation shows horizontal length and vertical height.

ANSWER: 11 cm by 10 cm rectangle

Worked solutions

Q09 | 2 MARKS

From the side, width and height are visible.

ANSWER: 14 by 11

Q10 | 2 MARKS

The plan is the view from above, so height is hidden.

ANSWER: 13 by 2 squares

Worked solutions

Q11 | 2 MARKS

A front elevation shows horizontal length and vertical height.

ANSWER: 14 cm by 13 cm rectangle

Q12 | 2 MARKS

From the side, width and height are visible.

ANSWER: 17 by 14

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FOUNDATION TIER

UNIT 4 | CHAPTER 12

FG12 - Units and measures

12 curated questions | complete solutions

Chapter focus

Use standard units of length, area, volume, capacity, mass, time and money.

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 12: FG12 - Units and measures

Q01 | 2 MARKS

Convert 0.4 m to centimetres.

Q02 | 2 MARKS

Convert 50000 cm² to m².

Chapter 12: FG12 - Units and measures

Q03 | 2 MARKS

Convert 6000000 cm³ to m³.

Q04 | 2 MARKS

Convert 3.5 litres to millilitres.

Chapter 12: FG12 - Units and measures

Q05 | 2 MARKS

Convert 0.8 m to centimetres.

Q06 | 2 MARKS

Convert 90000 cm² to m².

Chapter 12: FG12 - Units and measures

Q07 | 2 MARKS

Convert 10000000 cm³ to m³.

Q08 | 2 MARKS

Convert 5.5 litres to millilitres.

Chapter 12: FG12 - Units and measures

Q09 | 2 MARKS

Convert 1.2 m to centimetres.

Q10 | 2 MARKS

Convert 130000 cm² to m².

Chapter 12: FG12 - Units and measures

Q11 | 2 MARKS

Convert 14000000 cm³ to m³.

Q12 | 2 MARKS

Convert 7.5 litres to millilitres.

Worked solutions

Q01 | 2 MARKS

Multiply metres by 100.

ANSWER: 40 cm

Q02 | 2 MARKS

$1 \text{ m}^2 = 10,000 \text{ cm}^2$.

ANSWER: 5 m²

Worked solutions

Q03 | 2 MARKS

$1 \text{ m}^3 = 1,000,000 \text{ cm}^3$.

ANSWER: 6 m^3

Q04 | 2 MARKS

Multiply litres by 1000.

ANSWER: 3500 ml

Worked solutions

Q05 | 2 MARKS

Multiply metres by 100.

ANSWER: 80 cm

Q06 | 2 MARKS

$1 \text{ m}^2 = 10,000 \text{ cm}^2$.

ANSWER: 9 m²

Worked solutions

Q07 | 2 MARKS

$1 \text{ m}^3 = 1,000,000 \text{ cm}^3$.

ANSWER: 10 m^3

Q08 | 2 MARKS

Multiply litres by 1000.

ANSWER: 5500 ml

Worked solutions

Q09 | 2 MARKS

Multiply metres by 100.

ANSWER: 120 cm**Q10 | 2 MARKS**

$1 \text{ m}^2 = 10,000 \text{ cm}^2$.

ANSWER: 13 m²

Worked solutions

Q11 | 2 MARKS

$1 \text{ m}^3 = 1,000,000 \text{ cm}^3$.

ANSWER: 14 m^3

Q12 | 2 MARKS

Multiply litres by 1000.

ANSWER: 7500 ml

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 13

FG13 - Scale drawings and bearings

12 curated questions | complete solutions

Chapter focus

Measure and interpret lengths, angles, maps, scale drawings and three-figure bearings.

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: FG13 - Scale drawings and bearings

Q01 | 1 MARK

Write 30 degrees as a three-figure bearing.

Q02 | 3 MARKS

On a 1:50000 map, a route is 3 cm. Find its real length.

Chapter 13: FG13 - Scale drawings and bearings

Q03 | 2 MARKS

The bearing of B from A is 270 degrees. Find the bearing of A from B.

Q04 | 1 MARK

Write 120 degrees as a three-figure bearing.

Chapter 13: FG13 - Scale drawings and bearings

Q05 | 3 MARKS

On a 1:50000 map, a route is 4.5 cm. Find its real length.

Q06 | 2 MARKS

The bearing of B from A is 000 degrees. Find the bearing of A from B.

Chapter 13: FG13 - Scale drawings and bearings

Q07 | 1 MARK

Write 210 degrees as a three-figure bearing.

Q08 | 3 MARKS

On a 1:50000 map, a route is 6 cm. Find its real length.

Chapter 13: FG13 - Scale drawings and bearings

Q09 | 2 MARKS

The bearing of B from A is 090 degrees. Find the bearing of A from B.

Q10 | 1 MARK

Write 300 degrees as a three-figure bearing.

Chapter 13: FG13 - Scale drawings and bearings

Q11 | 3 MARKS

On a 1:50000 map, a route is 7.5 cm. Find its real length.

Q12 | 2 MARKS

The bearing of B from A is 180 degrees. Find the bearing of A from B.

Worked solutions

Q01 | 1 MARK

Bearings are measured clockwise from north and written with three digits.

ANSWER: 030 degrees

Q02 | 3 MARKS

$3 \times 50000 = 150000 \text{ cm} = 1.5 \text{ km}$.

ANSWER: 1.5 km

Worked solutions

Q03 | 2 MARKS

Reverse bearings differ by 180 degrees.

ANSWER: 090 degrees

Q04 | 1 MARK

Bearings are measured clockwise from north and written with three digits.

ANSWER: 120 degrees

Worked solutions

Q05 | 3 MARKS

$4.5 \times 50000 = 225000 \text{ cm} = 2.25 \text{ km}$.

ANSWER: 2.25 km

Q06 | 2 MARKS

Reverse bearings differ by 180 degrees.

ANSWER: 180 degrees

Worked solutions

Q07 | 1 MARK

Bearings are measured clockwise from north and written with three digits.

ANSWER: 210 degrees

Q08 | 3 MARKS

$6 \times 50000 = 300000 \text{ cm} = 3 \text{ km}$.

ANSWER: 3 km

Worked solutions

Q09 | 2 MARKS

Reverse bearings differ by 180 degrees.

ANSWER: 270 degrees

Q10 | 1 MARK

Bearings are measured clockwise from north and written with three digits.

ANSWER: 300 degrees

Worked solutions

Q11 | 3 MARKS

$7.5 \times 50000 = 375000 \text{ cm} = 3.75 \text{ km}$.

ANSWER: 3.75 km

Q12 | 2 MARKS

Reverse bearings differ by 180 degrees.

ANSWER: 000 degrees

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 14

FG14 - Area and volume formulae

12 curated questions | complete solutions

Chapter focus

Calculate areas of polygons and volumes of cuboids, prisms and cylinders.

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: FG14 - Area and volume formulae

Q01 | 2 MARKS

Find the area of a rectangle 4 cm by 6 cm.

Q02 | 2 MARKS

Find the area of a triangle with base 5 cm and perpendicular height 7 cm.

Chapter 14: FG14 - Area and volume formulae

Q03 | 3 MARKS

Find the area of a trapezium with parallel sides 6 cm and 8 cm and height 5 cm.

Q04 | 2 MARKS

Find the volume of a cuboid 7 cm by 9 cm by 6 cm.

Chapter 14: FG14 - Area and volume formulae

Q05 | 2 MARKS

Find the area of a rectangle 8 cm by 10 cm.

Q06 | 2 MARKS

Find the area of a triangle with base 9 cm and perpendicular height 11 cm.

Chapter 14: FG14 - Area and volume formulae

Q07 | 3 MARKS

Find the area of a trapezium with parallel sides 10 cm and 12 cm and height 9 cm.

Q08 | 2 MARKS

Find the volume of a cuboid 11 cm by 13 cm by 10 cm.

Chapter 14: FG14 - Area and volume formulae

Q09 | 2 MARKS

Find the area of a parallelogram with base 12 cm and perpendicular height 14 cm.

Q10 | 3 MARKS

A triangular prism has cross-sectional base 13 cm, perpendicular height 15 cm and length 14 cm. Find its volume.

Chapter 14: FG14 - Area and volume formulae

Q11 | 3 MARKS

Find the volume of a cylinder of radius 5 cm and height 14 cm. Give a decimal to 1 d.p.

Q12 | 3 MARKS

A composite area is a rectangle 15 cm by 17 cm plus a non-overlapping triangle of base 15 cm and height 14 cm. Find its area.

Worked solutions

Q01 | 2 MARKS

Area=length x width= $4 \times 6 = 24$.

ANSWER: 24 cm²

Q02 | 2 MARKS

Area= $\frac{1}{2} \times \text{base} \times \text{height} = 17.5$.

ANSWER: 17.5 cm²

Worked solutions

Q03 | 3 MARKS

$$\text{Area} = \frac{1}{2}(6+8) \times 5 = 35.$$

ANSWER: 35 cm²

Q04 | 2 MARKS

$$\text{Volume} = 7 \times 9 \times 6 = 378.$$

ANSWER: 378 cm³

Worked solutions

Q05 | 2 MARKS

Area=length x width= $8 \times 10 = 80$.

ANSWER: 80 cm²

Q06 | 2 MARKS

Area= $\frac{1}{2} \times \text{base} \times \text{height} = 49.5$.

ANSWER: 49.5 cm²

Worked solutions

Q07 | 3 MARKS

$$\text{Area} = \frac{1}{2}(10+12) \times 9 = 99.$$

ANSWER: 99 cm²**Q08 | 2 MARKS**

$$\text{Volume} = 11 \times 13 \times 10 = 1430.$$

ANSWER: 1430 cm³

Worked solutions

Q09 | 2 MARKS

Area=base x perpendicular height= $12 \times 14 = 168$.

ANSWER: 168 cm^2

Q10 | 3 MARKS

Cross-sectional area= $\frac{1}{2} \times 13 \times 15 = 97.5$; volume= $97.5 \times 14 = 1365$.

ANSWER: 1365 cm^3

Worked solutions

Q11 | 3 MARKS

$$V = \pi r^2 h = \pi \times 5^2 \times 14 = 1099.6 \text{ cm}^3.$$

ANSWER: 1099.6 cm³**Q12 | 3 MARKS**

$$\text{Rectangle area} = 255; \text{ triangle area} = 105; \text{ total} = 360 \text{ cm}^2.$$

ANSWER: 360 cm²

Chapter completion record

Question	Score / marks	Repair target	Retest date
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FOUNDATION TIER

UNIT 4 | CHAPTER 15

FG15 - Circles and composite solids

12 curated questions | complete solutions

Chapter focus

Calculate circle measures, composite areas, surface areas and volumes.

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 15: FG15 - Circles and composite solids

Q01 | 2 MARKS

Find the circumference of a circle of radius 3 cm. Give an exact answer.

Q02 | 2 MARKS

Find the area of a circle of radius 4 cm. Give an exact answer.

Chapter 15: FG15 - Circles and composite solids

Q03 | 3 MARKS

Find the volume of a cylinder of radius 5 cm and height 6 cm. Give an exact answer.

Q04 | 3 MARKS

Use $V = \frac{4}{3} \pi r^3$ to find the volume of a sphere of radius 6 cm.

Chapter 15: FG15 - Circles and composite solids

Q05 | 3 MARKS

Find the volume of a cone with radius 7 cm and perpendicular height 9 cm. Give a decimal to 1 d.p.

Q06 | 3 MARKS

A pyramid has rectangular base 9 cm by 11 cm and perpendicular height 10 cm. Find its volume.

Chapter 15: FG15 - Circles and composite solids

Q07 | 3 MARKS

Find the total surface area of a closed cylinder of radius 9 cm and height 10 cm. Give a decimal to 1 d.p.

Q08 | 3 MARKS

Use $A=4\pi r^2$ to find the surface area of a sphere of radius 10 cm.

Chapter 15: FG15 - Circles and composite solids

Q09 | 3 MARKS

A composite shape is a rectangle 12 cm by 14 cm with a semicircle of diameter 12 cm attached along one side. Find its area to 1 d.p.

Q10 | 4 MARKS

You must show your working.

A composite solid is a cylinder of radius 12 cm and height 13 cm with a hemisphere of the same radius. Find its volume to 1 d.p.

Chapter 15: FG15 - Circles and composite solids

Q11 | 3 MARKS

A closed cone has radius 13 cm and slant height 16 cm. Use $A = \pi rl + \pi r^2$ to find its total surface area to 1 d.p.

Q12 | 4 MARKS

You must show your working.

A rectangular-based pyramid has base 15 cm by 17 cm. Its two triangular faces with base 15 have slant height 17 cm and its other two have the same slant height. Find total surface area.

Worked solutions

Q01 | 2 MARKS

$$C = 2\pi r = 2\pi \times 3 = 6\pi \text{ cm.}$$

ANSWER: $6\pi \text{ cm}$

Q02 | 2 MARKS

$$A = \pi r^2 = 16\pi \text{ cm}^2.$$

ANSWER: $16\pi \text{ cm}^2$

Worked solutions

Q03 | 3 MARKS

$$V = \pi r^2 h = \pi \times 5^2 \times 6 = 150\pi.$$

ANSWER: $150\pi \text{ cm}^3$

Q04 | 3 MARKS

$$V = \frac{4}{3} \times \pi \times 6^3 = 904.8 \text{ cm}^3.$$

ANSWER: 904.8 cm^3

Worked solutions

Q05 | 3 MARKS

$$V = \frac{1}{3} \pi r^2 h = \frac{1}{3} \times \pi \times 7^2 \times 9 = 461.8 \text{ cm}^3.$$

ANSWER: 461.8 cm³**Q06 | 3 MARKS**

$$\text{Base area} = 9 \times 11 = 99; V = \frac{1}{3} \times 99 \times 10 = 330 \text{ cm}^3.$$

ANSWER: 330 cm³

Worked solutions

Q07 | 3 MARKS

Total surface area = $2\pi r^2 + 2\pi rh = 1074.4 \text{ cm}^2$.

ANSWER: 1074.4 cm^2

Q08 | 3 MARKS

$A = 4 \times \pi \times 10^2 = 1256.6 \text{ cm}^2$.

ANSWER: 1256.6 cm^2

Worked solutions

Q09 | 3 MARKS

Area = $12 \times 14 + \frac{1}{2} \times \pi \times (12/2)^2 = 224.5 \text{ cm}^2$.

ANSWER: 224.5 cm²**Q10 | 4 MARKS**

Add cylinder $\pi r^2 h$ and hemisphere $\frac{2}{3} \pi r^3$: 9500.2 cm^3 .

ANSWER: 9500.2 cm³

Worked solutions

Q11 | 3 MARKS

$$A = \pi \times 13 \times 16 + \pi \times 13^2 = 1184.4 \text{ cm}^2.$$

ANSWER: 1184.4 cm²**Q12 | 4 MARKS**

$$\text{Base} = 255; \text{paired triangle areas total } 255 + 289; \text{sum} = 799 \text{ cm}^2.$$

ANSWER: 799 cm²

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 16

FG16 - Arcs and sectors

12 curated questions | complete solutions

Chapter focus

Calculate arc lengths, sector angles and sector areas.

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: FG16 - Arcs and sectors

Q01 | 3 MARKS

Find the arc length of a sector with radius 4 cm and angle 30 degrees. Give an exact answer.

Q02 | 3 MARKS

Find the area of a sector with radius 5 cm and angle 60 degrees. Give an exact answer.

Chapter 16: FG16 - Arcs and sectors

Q03 | 2 MARKS

A sector is $\frac{1}{4}$ of a full circle. Find its angle.

Q04 | 3 MARKS

Find the arc length of a sector with radius 7 cm and angle 120 degrees. Give an exact answer.

Chapter 16: FG16 - Arcs and sectors

Q05 | 3 MARKS

Find the area of a sector with radius 8 cm and angle 150 degrees. Give an exact answer.

Q06 | 2 MARKS

A sector is $\frac{1}{2}$ of a full circle. Find its angle.

Chapter 16: FG16 - Arcs and sectors

Q07 | 3 MARKS

Find the arc length of a sector with radius 10 cm and angle 210 degrees. Give an exact answer.

Q08 | 3 MARKS

Find the area of a sector with radius 11 cm and angle 240 degrees. Give an exact answer.

Chapter 16: FG16 - Arcs and sectors

Q09 | 2 MARKS

A sector is $\frac{3}{4}$ of a full circle. Find its angle.

Q10 | 3 MARKS

Find the arc length of a sector with radius 13 cm and angle 300 degrees. Give an exact answer.

Chapter 16: FG16 - Arcs and sectors

Q11 | 3 MARKS

Find the area of a sector with radius 14 cm and angle 330 degrees. Give an exact answer.

Q12 | 2 MARKS

A sector is $\frac{1}{4}$ of a full circle. Find its angle.

Worked solutions

Q01 | 3 MARKS

$$\text{Arc} = \frac{30}{360} \times 2\pi \times 4 = \frac{2}{3}\pi \text{ cm.}$$

ANSWER: $\frac{2}{3}\pi$ cm**Q02 | 3 MARKS**

$$\text{Area} = \frac{60}{360} \times \pi \times 5^2 = \frac{25}{6}\pi \text{ cm}^2.$$

ANSWER: $\frac{25}{6}\pi$ cm²

Worked solutions

Q03 | 2 MARKS

Multiply $\frac{1}{4}$ by 360 degrees.

ANSWER: 90 degrees

Q04 | 3 MARKS

$\text{Arc} = \frac{120}{360} \times 2\pi \times 7 = \frac{14}{3}\pi \text{ cm}$.

ANSWER: $\frac{14}{3}\pi \text{ cm}$

Worked solutions

Q05 | 3 MARKS

Area = $150/360 \times \pi \times 8^2 = 80/3\pi \text{ cm}^2$.

ANSWER: $80/3\pi \text{ cm}^2$

Q06 | 2 MARKS

Multiply $1/2$ by 360 degrees.

ANSWER: 180 degrees

Worked solutions

Q07 | 3 MARKS

$$\text{Arc} = 210/360 \times 2\pi \times 10 = 35/3\pi \text{ cm.}$$

ANSWER: $35/3\pi \text{ cm}$

Q08 | 3 MARKS

$$\text{Area} = 240/360 \times \pi \times 11^2 = 242/3\pi \text{ cm}^2.$$

ANSWER: $242/3\pi \text{ cm}^2$

Worked solutions

Q09 | 2 MARKS

Multiply $\frac{3}{4}$ by 360 degrees.

ANSWER: 270 degrees

Q10 | 3 MARKS

$\text{Arc} = \frac{300}{360} \times 2\pi \times 13 = \frac{65}{3}\pi \text{ cm}$.

ANSWER: $\frac{65}{3}\pi \text{ cm}$

Worked solutions

Q11 | 3 MARKS

Area = $\frac{330}{360} \times \pi \times 14^2 = \frac{539}{3}\pi \text{ cm}^2$.

ANSWER: $\frac{539}{3}\pi \text{ cm}^2$

Q12 | 2 MARKS

Multiply 1 by 360 degrees.

ANSWER: 360 degrees

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FOUNDATION TIER

UNIT 4 | CHAPTER 17

FG17 - Congruence and similarity calculations

12 curated questions | complete solutions

Chapter focus

Use length relationships in congruent and similar figures.

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 17: FG17 - Congruence and similarity calculations

Q01 | 2 MARKS

Similar shapes have scale factor 3 from small to large. A small side is 4 cm. Find the matching large side.

Q02 | 2 MARKS

A corresponding pair of similar sides is 5 cm and 20 cm. Find the scale factor small to large.

Chapter 17: FG17 - Congruence and similarity calculations

Q03 | 2 MARKS

Two congruent triangles have corresponding sides 6 cm and x cm. Find x and explain.

Q04 | 2 MARKS

Similar shapes have scale factor 2 from small to large. A small side is 7 cm. Find the matching large side.

Chapter 17: FG17 - Congruence and similarity calculations

Q05 | 2 MARKS

A corresponding pair of similar sides is 8 cm and 24 cm. Find the scale factor small to large.

Q06 | 2 MARKS

Two congruent triangles have corresponding sides 9 cm and x cm. Find x and explain.

Chapter 17: FG17 - Congruence and similarity calculations

Q07 | 2 MARKS

Similar shapes have scale factor 5 from small to large. A small side is 10 cm. Find the matching large side.

Q08 | 2 MARKS

A corresponding pair of similar sides is 11 cm and 22 cm. Find the scale factor small to large.

Chapter 17: FG17 - Congruence and similarity calculations

Q09 | 2 MARKS

Two congruent triangles have corresponding sides 12 cm and x cm. Find x and explain.

Q10 | 2 MARKS

Similar shapes have scale factor 4 from small to large. A small side is 13 cm. Find the matching large side.

Chapter 17: FG17 - Congruence and similarity calculations

Q11 | 2 MARKS

A corresponding pair of similar sides is 14 cm and 70 cm. Find the scale factor small to large.

Q12 | 2 MARKS

Two congruent triangles have corresponding sides 15 cm and x cm. Find x and explain.

Worked solutions

Q01 | 2 MARKS

Multiply by the length scale factor: 4×3 .

ANSWER: 12 cm**Q02 | 2 MARKS**

Scale factor = $20 \div 5 = 4$.

ANSWER: 4

Worked solutions

Q03 | 2 MARKS

Congruent shapes have equal corresponding lengths.

ANSWER: 6 cm

Q04 | 2 MARKS

Multiply by the length scale factor: 7×2 .

ANSWER: 14 cm

Worked solutions

Q05 | 2 MARKS

Scale factor= $24 \div 8 = 3$.

ANSWER: 3

Q06 | 2 MARKS

Congruent shapes have equal corresponding lengths.

ANSWER: 9 cm

Worked solutions

Q07 | 2 MARKS

Multiply by the length scale factor: 10×5 .

ANSWER: 50 cm**Q08 | 2 MARKS**

Scale factor = $22 \div 11 = 2$.

ANSWER: 2

Worked solutions

Q09 | 2 MARKS

Congruent shapes have equal corresponding lengths.

ANSWER: 12 cm

Q10 | 2 MARKS

Multiply by the length scale factor: 13×4 .

ANSWER: 52 cm

Worked solutions

Q11 | 2 MARKS

Scale factor= $70 \div 14 = 5$.

ANSWER: 5

Q12 | 2 MARKS

Congruent shapes have equal corresponding lengths.

ANSWER: 15 cm

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 18

FG18 - Pythagoras and trigonometry

12 curated questions | complete solutions

Chapter focus

Apply Pythagoras and the trigonometric ratios in right-angled triangles.

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 18: FG18 - Pythagoras and trigonometry

Q01 | 3 MARKS

Find the hypotenuse of a right triangle with legs 4 cm and 5 cm.

Q02 | 3 MARKS

In a right triangle, the hypotenuse is 12 cm and an angle is 40 degrees. Find the opposite side.

Chapter 18: FG18 - Pythagoras and trigonometry

Q03 | 3 MARKS

A right triangle has opposite side 7 cm and adjacent side 9 cm. Find the angle.

Q04 | 3 MARKS

Find the hypotenuse of a right triangle with legs 7 cm and 8 cm.

Chapter 18: FG18 - Pythagoras and trigonometry

Q05 | 3 MARKS

In a right triangle, the hypotenuse is 15 cm and an angle is 55 degrees. Find the opposite side.

Q06 | 3 MARKS

A right triangle has opposite side 10 cm and adjacent side 12 cm. Find the angle.

Chapter 18: FG18 - Pythagoras and trigonometry

Q07 | 3 MARKS

Find the hypotenuse of a right triangle with legs 10 cm and 11 cm.

Q08 | 3 MARKS

In a right triangle, the hypotenuse is 18 cm and an angle is 30 degrees. Find the opposite side.

Chapter 18: FG18 - Pythagoras and trigonometry

Q09 | 3 MARKS

A right triangle has opposite side 13 cm and adjacent side 15 cm. Find the angle.

Q10 | 3 MARKS

Find the hypotenuse of a right triangle with legs 13 cm and 14 cm.

Chapter 18: FG18 - Pythagoras and trigonometry

Q11 | 3 MARKS

In a right triangle, the hypotenuse is 21 cm and an angle is 45 degrees. Find the opposite side.

Q12 | 3 MARKS

A right triangle has opposite side 16 cm and adjacent side 18 cm. Find the angle.

Worked solutions

Q01 | 3 MARKS

$$c = \sqrt{4^2 + 5^2} = 6.40 \text{ cm.}$$

ANSWER: 6.40 cm**Q02 | 3 MARKS**

$$\sin 40 = \text{opposite}/12; \text{opposite} = 12 \sin 40 = 7.71.$$

ANSWER: 7.71 cm

Worked solutions

Q03 | 3 MARKS

$\tan \text{ angle} = 7/9$; $\text{angle} = \tan^{-1}(7/9) = 37.9 \text{ degrees}$.

ANSWER: 37.9 degrees**Q04 | 3 MARKS**

$c = \sqrt{7^2 + 8^2} = 10.63 \text{ cm}$.

ANSWER: 10.63 cm

Worked solutions

Q05 | 3 MARKS

$\sin 55 = \text{opposite}/15$; $\text{opposite} = 15 \sin 55 = 12.29$.

ANSWER: 12.29 cm

Q06 | 3 MARKS

$\tan \text{angle} = 10/12$; $\text{angle} = \tan^{-1}(10/12) = 39.8 \text{ degrees}$.

ANSWER: 39.8 degrees

Worked solutions

Q07 | 3 MARKS

$$c = \sqrt{10^2 + 11^2} = 14.87 \text{ cm.}$$

ANSWER: 14.87 cm**Q08 | 3 MARKS**

$$\sin 30 = \text{opposite}/18; \text{opposite} = 18 \sin 30 = 9.00.$$

ANSWER: 9.00 cm

Worked solutions

Q09 | 3 MARKS

$\tan \text{ angle} = 13/15$; $\text{angle} = \tan^{-1}(13/15) = 40.9 \text{ degrees}$.

ANSWER: 40.9 degrees

Q10 | 3 MARKS

$c = \sqrt{13^2 + 14^2} = 19.10 \text{ cm}$.

ANSWER: 19.10 cm

Worked solutions

Q11 | 3 MARKS

$\sin 45 = \text{opposite}/21$; $\text{opposite} = 21 \sin 45 = 14.85$.

ANSWER: 14.85 cm

Q12 | 3 MARKS

$\tan \text{angle} = 16/18$; $\text{angle} = \tan^{-1}(16/18) = 41.6$ degrees.

ANSWER: 41.6 degrees

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FOUNDATION TIER

UNIT 4 | CHAPTER 19

FG19 - Exact trigonometric values

12 curated questions | complete solutions

Chapter focus

Know and use the specified exact values of sine, cosine and tangent.

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 19: FG19 - Exact trigonometric values

Q01 | 1 MARK

State the exact value of $\sin 0$ degrees.

Q02 | 1 MARK

State the exact value of $\sin 30$ degrees.

Chapter 19: FG19 - Exact trigonometric values

Q03 | 1 MARK

State the exact value of $\sin 45$ degrees.

Q04 | 1 MARK

State the exact value of $\sin 60$ degrees.

Chapter 19: FG19 - Exact trigonometric values

Q05 | 1 MARK

State the exact value of $\sin 90$ degrees.

Q06 | 1 MARK

State the exact value of $\cos 0$ degrees.

Chapter 19: FG19 - Exact trigonometric values

Q07 | 1 MARK

State the exact value of $\cos 30$ degrees.

Q08 | 1 MARK

State the exact value of $\cos 45$ degrees.

Chapter 19: FG19 - Exact trigonometric values

Q09 | 1 MARK

State the exact value of $\cos 60$ degrees.

Q10 | 1 MARK

State the exact value of $\cos 90$ degrees.

Chapter 19: FG19 - Exact trigonometric values

Q11 | 1 MARK

State the exact value of $\tan 0$ degrees and $\tan 30$ degrees.

Q12 | 1 MARK

State the exact value of $\tan 45$ degrees and $\tan 60$ degrees.

Worked solutions

Q01 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: 0

Q02 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: 1/2

Worked solutions

Q03 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: $\frac{\sqrt{2}}{2}$

Q04 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: $\frac{\sqrt{3}}{2}$

Worked solutions

Q05 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: 1

Q06 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: 1

Worked solutions

Q07 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: $\frac{\sqrt{3}}{2}$

Q08 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: $\frac{\sqrt{2}}{2}$

Worked solutions

Q09 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: 1/2

Q10 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: 0

Worked solutions

Q11 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: 0 and $\sqrt{3}/3$

Q12 | 1 MARK

Recall the exact-value table for the standard angles.

ANSWER: 1 and $\sqrt{3}$

Chapter completion record

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FOUNDATION TIER

UNIT 4 | CHAPTER 20

FG20 - Translation vectors

12 curated questions | complete solutions

Chapter focus

Describe translations using two-dimensional column vectors.

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 20: FG20 - Translation vectors

Q01 | 2 MARKS

Point A(3,2) maps to A'(-2,-2). Describe the translation as a column vector.

Q02 | 2 MARKS

Point A(4,1) maps to A'(0,-2). Describe the translation as a column vector.

Chapter 20: FG20 - Translation vectors

Q03 | 2 MARKS

Point A(5,0) maps to A'(2,-2). Describe the translation as a column vector.

Q04 | 2 MARKS

Point A(6,-1) maps to A'(4,-2). Describe the translation as a column vector.

Chapter 20: FG20 - Translation vectors

Q05 | 2 MARKS

Point A(7,-2) maps to A'(6,-2). Describe the translation as a column vector.

Q06 | 2 MARKS

Point A(8,-3) maps to A'(8,-2). Describe the translation as a column vector.

Chapter 20: FG20 - Translation vectors

Q07 | 2 MARKS

Point A(9,-4) maps to A'(10,-2). Describe the translation as a column vector.

Q08 | 2 MARKS

Point A(10,-5) maps to A'(12,-2). Describe the translation as a column vector.

Chapter 20: FG20 - Translation vectors

Q09 | 2 MARKS

Point A(11,-6) maps to A'(14,-2). Describe the translation as a column vector.

Q10 | 2 MARKS

Point A(12,-7) maps to A'(16,-2). Describe the translation as a column vector.

Chapter 20: FG20 - Translation vectors

Q11 | 2 MARKS

Point A(13,-8) maps to A'(18,-2). Describe the translation as a column vector.

Q12 | 2 MARKS

Point A(14,-9) maps to A'(20,-2). Describe the translation as a column vector.

Worked solutions

Q01 | 2 MARKS

Change in $x = -2 - 3 = -5$; change in $y = -2 - (2) = -4$.

ANSWER: $(-5, -4)$ **Q02 | 2 MARKS**

Change in $x = 0 - 4 = -4$; change in $y = -2 - (1) = -3$.

ANSWER: $(-4, -3)$

Worked solutions

Q03 | 2 MARKS

Change in $x=2-5=-3$; change in $y=-2-(0)=-2$.

ANSWER: $(-3,-2)$ **Q04 | 2 MARKS**

Change in $x=4-6=-2$; change in $y=-2-(-1)=-1$.

ANSWER: $(-2,-1)$

Worked solutions

Q05 | 2 MARKS

Change in $x=6-7=-1$; change in $y=-2-(-2)=0$.

ANSWER: (-1,0)**Q06 | 2 MARKS**

Change in $x=8-8=0$; change in $y=-2-(-3)=1$.

ANSWER: (0,1)

Worked solutions

Q07 | 2 MARKS

Change in $x=10-9=1$; change in $y=-2-(-4)=2$.

ANSWER: (1,2)**Q08 | 2 MARKS**

Change in $x=12-10=2$; change in $y=-2-(-5)=3$.

ANSWER: (2,3)

Worked solutions

Q09 | 2 MARKS

Change in $x=14-11=3$; change in $y=-2-(-6)=4$.

ANSWER: (3,4)**Q10 | 2 MARKS**

Change in $x=16-12=4$; change in $y=-2-(-7)=5$.

ANSWER: (4,5)

Worked solutions

Q11 | 2 MARKS

Change in $x=18-13=5$; change in $y=-2-(-8)=6$.

ANSWER: (5,6)**Q12 | 2 MARKS**

Change in $x=20-14=6$; change in $y=-2-(-9)=7$.

ANSWER: (6,7)

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FOUNDATION TIER

UNIT 4 | CHAPTER 21

FG21 - Vector arithmetic

12 curated questions | complete solutions

Chapter focus

Add, subtract and scale vectors in diagrammatic and column 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 21: FG21 - Vector arithmetic

Q01 | 2 MARKS

Given $a=(1,4)$ and $b=(6,1)$, find $a+b$.

Q02 | 2 MARKS

Given $a=(2,5)$ and $b=(7,0)$, find $a-b$.

Chapter 21: FG21 - Vector arithmetic

Q03 | 2 MARKS

Given $a=(3,6)$, find $2a$.

Q04 | 2 MARKS

Given $a=(4,7)$ and $b=(9,-2)$, find $a+b$.

Chapter 21: FG21 - Vector arithmetic

Q05 | 2 MARKS

Given $a=(5,8)$ and $b=(10,-3)$, find $a-b$.

Q06 | 2 MARKS

Given $a=(6,9)$, find $2a$.

Chapter 21: FG21 - Vector arithmetic

Q07 | 2 MARKS

Given $a=(7,10)$ and $b=(12,-5)$, find $a+b$.

Q08 | 2 MARKS

Given $a=(8,11)$ and $b=(13,-6)$, find $a-b$.

Chapter 21: FG21 - Vector arithmetic

Q09 | 2 MARKS

Given $a=(9,12)$, find $2a$.

Q10 | 2 MARKS

Given $a=(10,13)$ and $b=(15,-8)$, find $a+b$.

Chapter 21: FG21 - Vector arithmetic

Q11 | 2 MARKS

Given $a=(11,14)$ and $b=(16,-9)$, find $a-b$.

Q12 | 2 MARKS

Given $a=(12,15)$, find $2a$.

Worked solutions

Q01 | 2 MARKS

Add corresponding components.

ANSWER: (7,5)**Q02 | 2 MARKS**

Subtract corresponding components.

ANSWER: (-5,5)

Worked solutions

Q03 | 2 MARKS

Multiply each component by 2.

ANSWER: (6,12)**Q04 | 2 MARKS**

Add corresponding components.

ANSWER: (13,5)

Worked solutions

Q05 | 2 MARKS

Subtract corresponding components.

ANSWER: (-5,11)

Q06 | 2 MARKS

Multiply each component by 2.

ANSWER: (12,18)

Worked solutions

Q07 | 2 MARKS

Add corresponding components.

ANSWER: (19,5)

Q08 | 2 MARKS

Subtract corresponding components.

ANSWER: (-5,17)

Worked solutions

Q09 | 2 MARKS

Multiply each component by 2.

ANSWER: (18,24)

Q10 | 2 MARKS

Add corresponding components.

ANSWER: (25,5)

Worked solutions

Q11 | 2 MARKS

Subtract corresponding components.

ANSWER: (-5,23)**Q12 | 2 MARKS**

Multiply each component by 2.

ANSWER: (24,30)

Chapter completion record

Question	Score / marks	Repair target	Retest date
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

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