



GCSE Foundation 21

Shape, space and measure



110 minutes



108 marks

Mensuration

M1. (a) 12

B1

cm²

B1

(b) (x) 2

Do not accept 'double' or 'twice as big'

B1

[3]

M2. Any indication that all sides equal 5.2

eg 5 × 5.2

5.2 labelled on one sloped side of shape

M1

26

A1

[2]

M3. Any combination of 5 or 4 seen or implied

or 34 – 2 or 32 seen

or 34 – 10 or 24 seen

eg 4 + 4 ...

5 + 5

5 + 4 ...

14, 18, ...

9, 13, ...

M1

$(34 - 2) \div 4$ or $(34 - 2 \times 5) \div 4$ (= 6)

oe

5 + 4 + 4 + 4 + 4 + 4 + 4 + 5

or 14, 18, 22, 26, 30, 34

or 9, 13, 17, 21, 25, 29, 34

M1 dep

8

A1

[3]

M4. $\pi \times 6^2$

M1

113.(...) or 36π

A1

[2]

M5. Three numbers that add up to 52 or $4 \times$ any length
or states there are 4 lengths, 4 widths and 4 heights
eg 32, 12, 8

M1

The three numbers each divided by 4 or $52 \div 4 (= 13)$
or Three dimensions with total [12.7, 13.3]

eg $32 \div 4$, $12 \div 4$, $8 \div 4$

M1 dep

Three dimensions with a total of 13 cm (all different)

eg 8, 3, 2

A1

[3]

M6. (a) Fully correct rectangle
B1 for one correct side

B2

(b) (i) Sometimes true

B1

(ii) Never true

B1

(iii) Always true

B1

[5]

M7. 4×2 or 2×2 or 8
or sight of 4, 2 and 2 on diagram

M1

$4 \times 2 \times 2$ or 8×2
or 4×4 or $8 + 8$

M1 dep

16

A1

[3]

M8. (a) 1 km = 1000 m **or**
 area = $1000 \times 10 = 10\,000\text{ m}^2$

B1

(b) 200 or 7000 seen

B1

$$7000 \div 200$$

M1

$$35$$

A1

[4]

M9. $3.14(1\dots) \times 10.5$

M1

32.9 to 33

A1

[2]

M10. 4×2 or 2×2 or 8

*Can be seen within an incorrect calculation
 eg, $4 \times 2 \times 4$, $4 \times 4 \times 2$*

M1

$$4 \times 2 \times 2 \text{ or } 8 \times 2 \text{ or } 4 \times 4$$

M1 dep

$$16$$

A1

[3]

M11. (a) Two **different** rectangles **drawn** with area 12 cm^2

eg, 1 by 12 or 2 by 6 or 3 by 4
 Allow eg, 8 by 1.5

*B1 Any one rectangle **drawn** with an area of 12 cm^2
 or*

*Two **different** rectangles **drawn** with the **same** area*

B2

- (b) Both (their) perimeters correct
eg, 26, 16 or 14

B1 ft

Correct subtraction of (their) perimeters

eg, 10, 12 or 2

Award this mark **only** if one or both of (their) perimeters are correct.

B1 ft

[4]

M12. Number of cans in length (L)

Number of cans width (W)

Number of cans in height (H)

($LWH = 48$)

For example

$L = 8, W = 2, H = 3$

$L = 4, W = 4, H = 3$

$L = 6, W = 4, H = 2$

$L = 12, W = 4, H = 1$

$L = 16, W = 3, H = 1$

$L = 12, W = 2, H = 2$

Not $L = 48, W = 1, H = 1$

M1

Calculating dimensions from:

(their) $L \times 74$ or 75

(their) $W \times 74$ or 75

(their) $H \times 108$ or 110

Award this mark for two correct dimensions
from $\times 74$ (75) and $\times 108$ (110) with L, W and H
any factors of 48 apart from 1 (**not** 74 and 108)
Allow rounded lengths (75 and 110)

M1

For example

592 by 148 by 324 or

296 by 296 by 324 or

444 by 296 by 216

Allow rounded lengths

eg, 600 by 150 by 330 or

300 by 300 by 330 or

450 by 300 by 220

Not 3552 by 108 by 74 oe

A1

[3]

M13. (a) Equal to

B1

(b) Less than

B1

[2]

M14. Area of triangle = $\frac{1}{2} \times 9 \times 1$
or 4.5

$$\text{Length of square} = \sqrt{9^2 + 1^2}$$

M1

100 – 4 × their 4.5

$$\sqrt{82}$$

M1 dep

82

A1

[3]

M15. (a) 8×6

Do not accept $8 \times 6 \div 2$

M1

48

A1

cm²

Units mark

B1

(b) (i) Trapezium

B1

(ii) $14 \times 6 \div 2$ or

Area of rectangle $\div 2$

Half the area of both shapes

E1 For partial explanation

eg, area of rectangle – area of A

42 without working

E2

[6]

M16. (a) $\sqrt{387.5}$
or length² = 387.5

M1

19.685(01969)

A1

(b) 19.7

B1ft

[3]

M17. (a) 20

B1

(b) 3 by 3 square drawn
B1 12 ÷ 4 (= 3)
or 5 by 1 or 4 by 2 rectangle drawn

B2

[3]

M18. (a) $2x + 3y + 4x + 2y + 3x + 5x + y$
14x or 6y seen

M1

$14x + 6y$

A1

(b) 'Their 14' × 4 + 'their 6' × y = 68

M1

'Their 6y' = 'their 12'

M1

(y =) 2
ft Their answer for (a) with 2 terms

A1ft

[5]

M19.	$\pi \times 30^2$ (2827)	M1	
	80 × 80 – ‘Their 900π’	M1dep	
	3570 to 3574	A1	[3]
M20.	(a) (i) Kite	B1	
	(ii) Trapezium	B1	
	(b) Rectangle drawn	B1	
	(c) Equilateral triangle drawn <i>2 possible sizes</i>	B1	
	(d) $P = 2 \times 3 + 2 \times 5.2$ $6 + 10.4, 2 \times 8.2$	M1	
	16.4	A1	
	(e) Method 1 Attempt to compare using equilateral triangles/rhombi Method 2 Using formulae <i>Method 1 eg, 2 bottom halves equal and lines drawn</i> <i>Method 2 eg, $b \times h$ for rhombus or $\frac{1}{2}b \times h$ for triangle</i>	B1	
	Complete argument <i>Method 1 Show that both top halves are $\frac{1}{2}$ of a rhombus or are the same</i> <i>Method 2 Using both formulae and triangle has double the base (or height) oe</i> <i>B2 Complete hexagon on diagram and show each is 1/3 of hexagon</i>	B1	[8]
M21.	(a) Q(5, 4), R(4, 0), S(0, 1) <i>B1 for 2 correct</i>	B2	

(b) $\frac{1}{2} \times 4 \times 1$ or 2
or length of side = 4.1cm (± 1 mm)

M1

4 \times (their 2) + 9 or

25 – 4 \times (their 2)
or (their length)²

M1

17

M2A1 17 (counting squares)
SC2 17 with no working
SC1 15 to 19 inclusive

A1

cm²

B1

[6]

M22. 1 by 5 by 2 identified
or height = 2 or base = 1 \times 5

B1

2(1 \times 5 + 1 \times 2 + 2 \times 5)
oe area of 6 faces attempted

M1

34

A1

[3]

M23. Rectangle with area 12 cm²
Accept lines non-ruled if intention is clear
B1 for rectangle with perimeter of 12 cm

B2

[2]

M24. (a) 30 \times 30

M1

900

A1

(b) 50

B1

- (c) $300 \div 30$ or $180 \div 30$
or 300×180

M1

their $10 \times$ their 6
or their $54\,000 \div$ their 900

M1

60

A1

[6]

M25. (a) 8

B1

(b) A&C

B1

(c) Attempt to find area

*Lines on diagram making triangles or rhombi; correct
number of triangles/rhombi in two or more shapes:
12, 7, 8, 8 or $6, 3\frac{1}{2}$, 4, 4*

M1

D&C

A1

[4]

M26. $28.8 \div 2$

$28.8 - 2 \times 10.8$

M1

Their $14.4 - 10.8$

Their $7.2 \div 2$

M1 dep

3.6

A1

[3]

- M27.** Length 8 and width 5
allow 8 by 5 rectangle drawn
or B1 rectangle with area 40
or B1 rectangle with perimeter 26 cm

B2

[2]

- M28.** (a) $12^2 (-) 2 \times 4^2$
 oe

M1

112

A1

cm²

Units mark

B1

- (b) $9x^2$

or attempt to use their 112 and 144

B1

Attempt to calculate shaded area ($= 7x^2$)

or $\frac{\text{their } 112}{144}$

$(3x \times 3x) (-) 2(x \times x)$

M1

$\frac{7}{9}$

Note: $\frac{2}{9}$ score B1M1A0 (unshaded)

A1

[6]

- M29.** (a) Q(5, 4), R(4, 0), S(0, 1)
B1 for 2 correct

B2

(b) $\frac{1}{2} \times 4 \times 1$ or 2
or length of side = 4.1cm ($\pm 1\text{mm}$)

M1

4 x (their 2) + 9 or

25 – 4 x (their 2)
or (their length)²

M1

17

M2A1 17 (counting squares)
SC2 17 with no working
SC1 15 to 19 inclusive

A1

cm²

B1

[6]

