

Area and Perimeter

GCSE Mathematics • **Foundation Tier** • Grades 2–3 • Non-calculator

WORKED SOLUTIONS

Name: _____ *worked example* _____

Class:

Total: ____ *50* ____ / 50

Show all your working. Marks are given for correct method as well as the final answer.

1. Work out the area of a rectangle 9 cm by 4 cm. [1 mark]

$$9 \times 4 = 36$$

Answer: _____ *36* _____ cm^2

2. Work out the perimeter of a rectangle 9 cm by 4 cm. [2 marks]

$$9 + 4 + 9 + 4 \\ = 26$$

Answer: _____ *26* _____ cm

3. Work out the area of a triangle with base 10 cm and height 6 cm. [2 marks]

$$\frac{1}{2} \times b \times h \\ \frac{1}{2} \times 10 \times 6 = 30$$

Answer: _____ *30* _____ cm^2

4. Work out the area of a parallelogram with base 7 cm and perpendicular height 5 cm. [2 marks]

$$\text{base} \times \text{height} \\ 7 \times 5 = 35 \\ \text{use the PERPENDICULAR height}$$

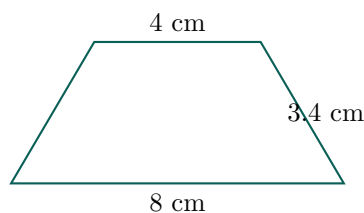
Answer: _____ *35* _____ cm^2

5. Work out the area of a square of side 12 cm. [1 mark]

$$12 \times 12 = 144$$

Answer: _____ *144* _____ cm^2

6. Work out the area of this trapezium. [3 marks]



$$\frac{1}{2}(a + b) \times h \\ \frac{1}{2}(8 + 4) \times 3.4 \\ 6 \times 3.4 = 20.4$$

Answer: _____ *20.4* _____ cm^2

7. Work out the circumference of a circle of radius 5 cm. Give your answer in terms of π . [2 marks]

$$C = 2\pi r \\ 2 \times \pi \times 5 = 10\pi$$

Answer: _____ *10 π* _____ cm

8. Work out the area of a circle of radius 3 cm. Give your answer in terms of π . [2 marks]

$$A = \pi r^2$$
$$\pi \times 3^2 = 9\pi$$

square the radius, not $2 \times r$

Answer: _____ 9π _____ cm^2

9. A circle has diameter 14 cm. Work out its circumference to 1 decimal place. [3 marks]

$$C = \pi d$$
$$\pi \times 14 = 43.98\dots$$
$$= 44.0$$

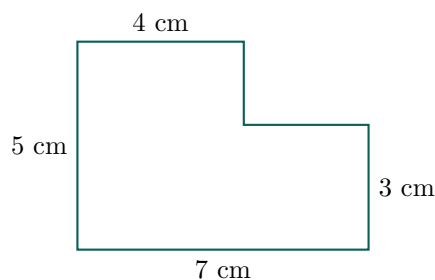
Answer: _____ 44.0 _____ cm

10. A circle has radius 8 cm. Work out its area to 1 decimal place. [3 marks]

$$\pi \times 64 = 201.06\dots$$
$$= 201.1$$

Answer: _____ 201.1 _____ cm^2

11. Work out the area of this compound shape. [3 marks]



split into two rectangles

bottom: $7 \times 3 = 21$

top: $4 \times 2 = 8$

$$21 + 8 = 29$$

Answer: _____ 29 _____ cm^2

12. A rectangle 10 cm by 6 cm has a 2 cm square cut out of it. Work out the remaining area. [3 marks]

whole: $10 \times 6 = 60$

hole: $2 \times 2 = 4$

$$60 - 4 = 56$$

Answer: _____ 56 _____ cm^2

13. A square lawn of side 12 m has a circular pond of radius 3 m in it. Work out the grass area, in terms of π . [3 marks]

lawn: $12^2 = 144$

pond: $\pi \times 9 = 9\pi$

$$144 - 9\pi$$

Answer: _____ $144 - 9\pi$ _____ m^2

14. A rectangle has area 48 cm^2 and width 6 cm. Work out its length. [2 marks]

$$48 \div 6 = 8$$

Answer: _____ 8 _____ cm

15. A triangle has area 24 cm^2 and base 8 cm . Work out its height. [3 marks]

$$\begin{aligned}\frac{1}{2} \times 8 \times h &= 24 \\ 4h &= 24 \\ h &= 6\end{aligned}$$

Answer: _____ 6 _____ cm

16. A square has perimeter 36 cm . Work out its area. [3 marks]

$$\begin{aligned}\text{side} &= 36 \div 4 = 9 \\ \text{area} &= 9 \times 9 = 81\end{aligned}$$

Answer: _____ 81 _____ cm^2

17. A circle has area $49\pi \text{ cm}^2$. Work out its radius. [2 marks]

$$\begin{aligned}\pi r^2 &= 49\pi \\ r^2 &= 49 \\ r &= 7\end{aligned}$$

Answer: _____ 7 _____ cm

18. Convert 3 m^2 into cm^2 . [2 marks]

$$\begin{aligned}1 \text{ m} &= 100 \text{ cm} \\ 1 \text{ m}^2 &= 100 \times 100 = 10000 \text{ cm}^2 \\ 3 \times 10000 &= 30000 \\ \text{NOT } 300 &\text{ -- area scales by } 100^2\end{aligned}$$

Answer: _____ 30000 cm^2 _____

19. Shape A is a 6×6 square. Shape B is a rectangle 9 cm by 4 cm . Which has the larger perimeter? Show working. [3 marks]

$$\begin{aligned}\text{A: } 4 \times 6 &= 24 \text{ cm} \\ \text{B: } 2(9 + 4) &= 26 \text{ cm} \\ \text{equal areas, different perimeters}\end{aligned}$$

Answer: B (26 cm vs 24 cm)

20. A path 1 m wide runs all the way around a rectangular garden measuring 8 m by 5 m .

- (a) Work out the area of the garden. [2 marks]

$$8 \times 5 = 40 \text{ m}^2$$

- (b) Work out the area of the path. [3 marks]

$$\begin{aligned}\text{outer rectangle is } 10 \text{ m by } 7 \text{ m} \\ 1 \text{ m on BOTH sides adds } 2 \\ 10 \times 7 &= 70 \\ 70 - 40 &= 30 \text{ m}^2\end{aligned}$$

Answer: _____ 40 m^2 ; 30 m^2 _____