Y8 DECEMBER ASSESSMENT

Section B

SOLUTIONS

Calculator

Time allowed: 28 mins

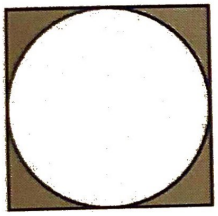
10 A wheel has a diameter of 70 cm. Work out its circumference. $= \pi d$

$\pi \times 70$

220 ..... cm²

(2 marks)

11 A circle fits exactly inside a square as shown.



The square has sides of length 10 cm.

a Work out the area of the circle.

πr^2

$\pi \times 5^2$

78.5 ..... cm²

b Work out the area shaded grey.

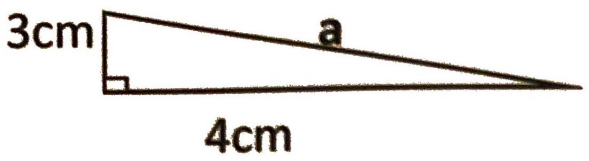
Square − Circle

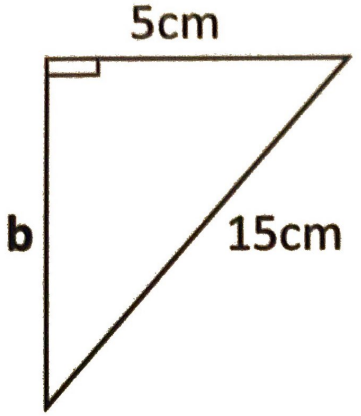
$10^2 - 78.5$

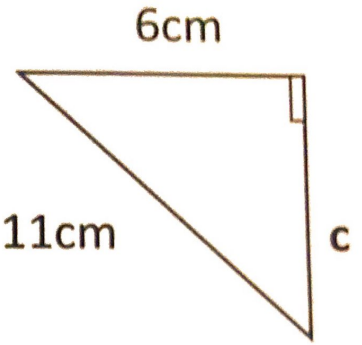
21.5 ..... cm²

(4 marks)

12. Find the missing lengths of the triangles below.







(9 marks)

$a^2 = 3^2 + 4^2$

$a^2 = 25$

$a = 5\text{cm}$

$b^2 + 5^2 = 15^2$

$b^2 = 15^2 - 5^2$

$b^2 = 200$

$b = \sqrt{200}$

$b = 14.1\text{cm}$

$c^2 + 6^2 = 11^2$

$c^2 = 11^2 - 6^2$

$c^2 = 85$

$c = \sqrt{85}$

$c = 9.2\text{cm}$

13. A triangle has sides with lengths of 5 metres, 8 metres and 10 metres. Is it a right angled triangle? Explain your reasoning. (2 marks)

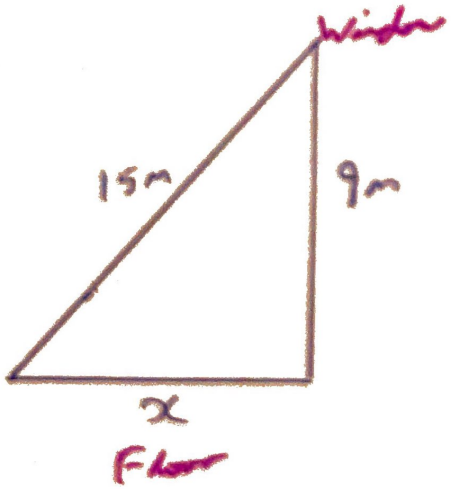
$5^2 + 8^2 = 25 + 64$

$= 89$

$10^2 = 100$

$5^2 + 8^2 \neq 10^2$ ∴ not right-angled

14. To wash a window that is 9 metres off the ground, Ben leans a 15 metre ladder against the side of the building. To reach the window, how far from the building should Ben place the base of the ladder? (3 marks)



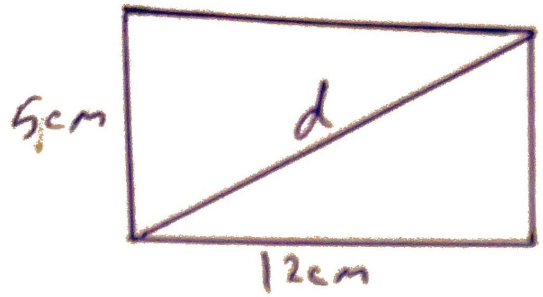
$x^2 + 9^2 = 15^2$

$x^2 = 15^2 - 9^2$

$x^2 = 9.22$

$x = \sqrt{9.22} = 3.04\text{m}$

15 A rectangle has length 5 cm and width 12 cm. Work out the length of the diagonal of the rectangle.



$d^2 = 5^2 + 12^2$

$d^2 = 169$

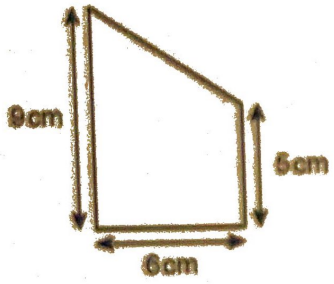
$d = \sqrt{169}$

$d = 13\text{cm}$

13 cm

(2 marks)

16 The cross-section of a prism is in the shape of a trapezium as shown.



The volume of the prism is 630 cm^3. Work out its length.

Area of trapezium $= \frac{5+9}{2} \times 6$

$= 42\text{cm}^2$

Area of cross-section × length = Volume

$42 \times \text{length} = 630$

$\text{length} = \frac{630}{42} = 15\text{cm}$

15 cm

(3 marks)

17 A water bottle in the shape of a cylinder holds 1 litre of water when full. Its height is 15 cm.

Work out the radius of the water bottle. (1 litre = 1000 cm^3)

Volume = $1000 cm^3$

$\pi r^2 \times 15 = 1000$

$\pi r^2 = \frac{1000}{15}$

$r^2 = \frac{1000}{15\pi}$

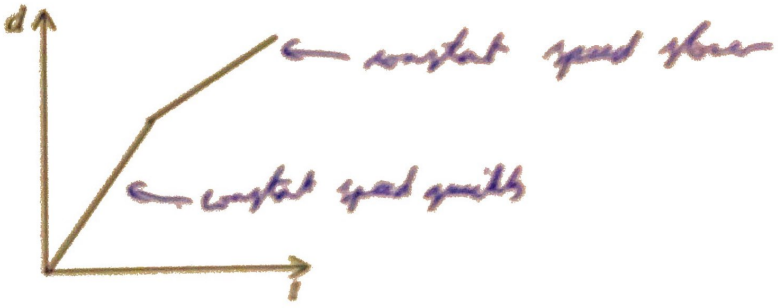
$r = \sqrt{\frac{1000}{15\pi}}$

$= 4.61 cm$

.....4.61 cm

(3 marks)

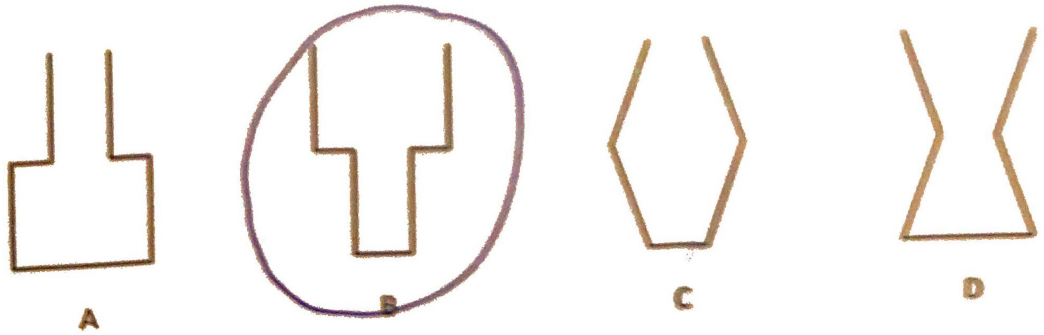
18 This graph shows the change of depth, *d*, of water against time, *t*, as a container is filled at a constant rate.



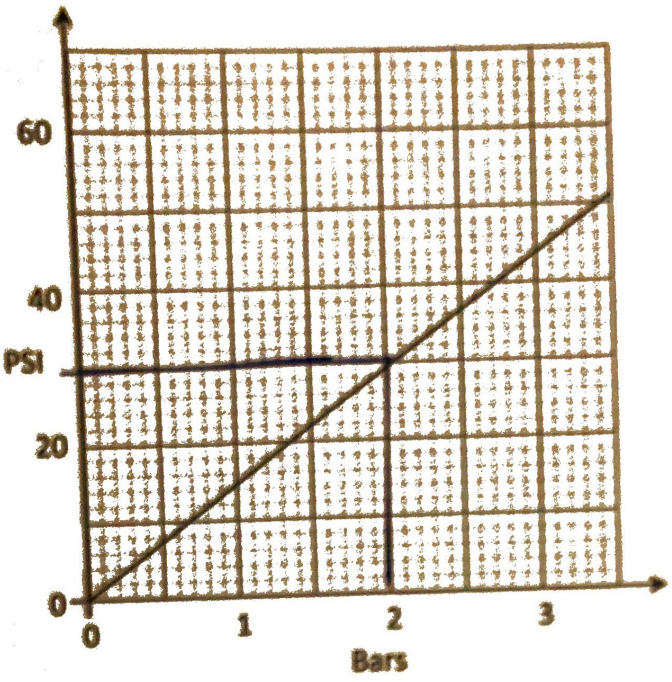
Which of these is the container?

Circle the correct letter.

[1 mark]



19 Here is a conversion graph between two units of pressure.



19 (a) A car tyre needs to be at a pressure of 30 psi.

What is this in Bars?

[1 mark]

Answer 2 (allow 2.1)

19 (b) A racing bicycle has a recommended pressure of 7.5 Bars.

What is this in psi?

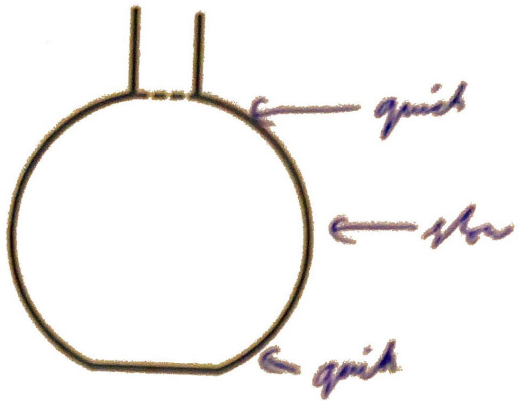
[2 marks]

1 bar per 15 psi. 7.5 bars = 15 × 7.5

Answer 112.5 psi

(allow any answer between 105 - 115).

20 Water is poured into this container at a constant rate until it reaches the dashed line.



speed slows down
then speeds up

One of these graphs shows the change of the depth, d, of water against time, t.
Circle the correct letter.

[1 mark]