

Brief Answers to Grade Grabber 5

Answer 1

$$\begin{aligned}\text{Area Shaded} &= 13.8 \times 7.6 - \pi \times 2.5^2 \\ &= 104.88 - 19.63495 \\ &= 85.2 \quad \text{must be to 3 sf} \quad 85.3 \text{ is acceptable}\end{aligned}$$

[3 marks]

Answer 2

$$\begin{aligned}x &= \sqrt{48^2 + 29^2 - 21^2} \quad \text{geek method} \\ x &= 52 \text{ cm}\end{aligned}$$

[3 marks]

Answer 3

The diameter of the circle will be $\sqrt{9.5^2 - 7.6^2} = 5.7 \text{ cm}$

$$\begin{aligned}\therefore \text{Area of shape} &= \frac{1}{2} \times 7.6 \times 5.7 + \frac{1}{2} \times \pi \times 2.85^2 \\ &= 34.4 \text{ cm}^2 \quad \text{must be to 3 sf}\end{aligned}$$

[3 marks]

Answer 4

Easiest method is to first get the triangle's perpendicular height, h , using Pythagoras' Theorem and then get the area using *half the base times the perpendicular height*

$$\begin{aligned}h &= \sqrt{15^2 - 12^2} \\ &= 9 \text{ cm} \\ \text{Area} &= \frac{1}{2} \times 24 \times 9 \\ &= 108 \text{ cm}^2\end{aligned}$$

[3 marks]

Answer 5

$$\begin{aligned}x + (x - 8) + x + (x - 8) &= 54 \\ x &= 17.5 \text{ cm} \\ \therefore \text{Area} &= 17.5 \times 9.5 \\ &= 166.25 \text{ cm}^2\end{aligned}$$

[4 marks]

Answer 6

$$\begin{aligned}\pi \times 8.5^2 &= \frac{1}{2} \times (20 + 25) \times h \\ 226.98 &= 22.5 h \\ h &= 10.1 \text{ cm} \quad \text{must be to 1 decimal place}\end{aligned}$$

[4 marks]

Answer 7

Spot the equilateral triangle to give the broken line a length of 15 m
 Then the Theorem of Pythagoras' gives the remaining side a length of 8 m
 $\therefore$ Perimeter is 55 m

[2 marks]**Answer 8**

Get the length of the square's diagonal using the Theorem of Pythagoras, 9.899 cm

$$\begin{aligned} \text{Shaded Area} &= \pi \times 4.9497^2 - 7 \times 7 \\ &= 28 \quad \text{must be to nearest whole number} \end{aligned}$$

[4 marks]**Answer 9**

$$\begin{aligned} x &= \frac{-6 \pm \sqrt{6^2 - 4 \times 1 \times (-11)}}{2 \times 1} \\ &= \frac{-6 \pm \sqrt{80}}{2} \\ &= \frac{-6 \pm \sqrt{16 \times 5}}{2} \\ &= \frac{-6}{2} \pm \frac{4\sqrt{5}}{2} \\ &= -3 \pm 2\sqrt{5} \end{aligned}$$

That is $p = -3$, $q = 2$ and $r = 5$

[4 marks]**Answer 10**

$$\begin{aligned} y^2 + 5x^2 &= 6 \\ (3x + 4)^2 + 5x^2 &= 6 \\ 9x^2 + 24x + 16 + 5x^2 &= 6 \\ 14x^2 + 24x + 10 &= 6 \\ \text{divide through by 2} \\ 7x^2 + 12x + 5 &= 0 \\ (7x + 5)(x + 1) &= 0 \end{aligned}$$

Either $x = -\frac{5}{7}$ or $x = -1$ giving $(-1, 1)$ or $(-\frac{5}{7}, \frac{13}{7})$

[5 marks]**Answer 11**

22400 cm³

[5 marks]