

$$1. \quad 28 \times 1.1^4 = 41 \text{ miles (to 1 d.p.)}$$

$$\begin{aligned} 2. \quad & (3x+1)(x^2-5x+4) \\ &= 3x(x^2-5x+4) + 1(x^2-5x+4) \\ &= 3x^3 - 15x^2 + 12x + x^2 - 5x + 4 \\ &= 3x^3 - 14x^2 + 7x + 4 \end{aligned}$$

$$3. \quad 2x^2 + 3x - 7 = 0$$

$$a = 2 \quad b = 3 \quad c = -7$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(3) \pm \sqrt{(3)^2 - 4(2)(-7)}}{2(2)}$$

$$x = \frac{-3 \pm \sqrt{9 + 56}}{4}$$

$$x = \frac{-3 \pm \sqrt{65}}{4}$$

$$x = \frac{-3 + \sqrt{65}}{4} \quad \text{or} \quad x = \frac{-3 - \sqrt{65}}{4}$$

$$x = 1.26 \quad x = -2.77$$

$$\Rightarrow x = -2.8, 1.3 \quad \text{to 2 sig. fig.}$$

$$4. \quad 84\% = \text{£}3780$$

$$\begin{aligned} 1\% &= \frac{\text{£}3780}{84} \\ &= \text{£}45 \end{aligned}$$

$$\begin{aligned} 100\% &= \text{£}45 \times 100 \\ &= \text{£}4500 \end{aligned}$$

Last year the car was worth £4500

$$5. \quad \frac{\text{Arc Length}}{\text{Circumference}} = \frac{\alpha}{360}$$

$$\frac{BC}{2(1.2)\pi} = \frac{42}{360}$$

$$BC = 2.4\pi \cdot \frac{42}{360}$$

$$BC = 0.88 \text{ m}$$

$BC < 0.9 \text{ m} \Rightarrow$ The staircase does NOT comply.

$$6. \quad \text{Scale Factor (length)} = \frac{125}{90}$$

$$= \frac{25}{18}$$

$$\text{Scale Factor (area)} = \left(\frac{25}{18}\right)^2$$

$$\text{Area B} = \left(\frac{25}{18}\right)^2 \times 4020$$

$$= 7755 \text{ cm}^2$$

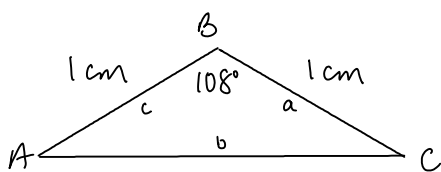
$$\frac{7755}{4020} = 1.93$$

Area B is not double Area A.

The claim is not justified.

$$7. (a) \quad \text{Angle } ABC = 108^\circ$$

(b)



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

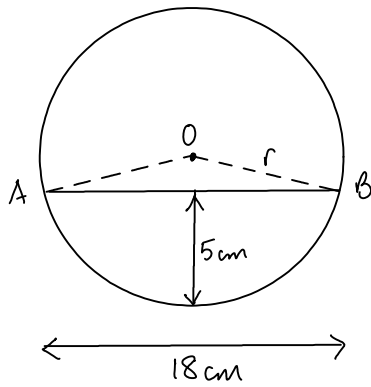
$$b^2 = (1)^2 + (1)^2 - 2(1)(1) \cos 108^\circ$$

$$b^2 = 2.6 \text{ cm}$$

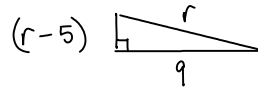
$$b = \sqrt{2.6}$$

$$b = 1.6 \text{ cm} \quad (\text{to 1 d.p.})$$

8.



$$\text{radius} = 10.6 \text{ cm}$$



$$r^2 = (r-5)^2 + 9^2$$

$$r^2 = r^2 - 10r + 25 + 81$$

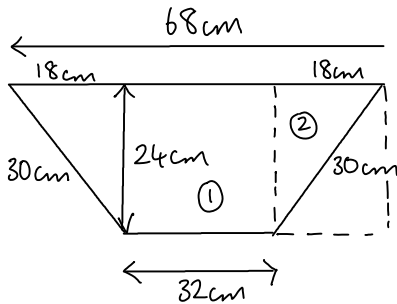
$$r^2 = r^2 - 10r + 106$$

$$0 = -10r + 106$$

$$10r = 106$$

$$r = 10.6$$

9. (a)



$$A_1 = 32 \times 24$$

$$= 768 \text{ cm}^2$$

$$A_2 = 24 \times 18$$

$$= 512 \text{ cm}^2$$

$$\text{Total cross-section area} = 768 + 512$$

$$= 1200 \text{ cm}^2$$

(b) $V = Ah$

$$156000 = 1200l$$

$$l = \frac{156000}{1200}$$

$$l = 130 \text{ cm}$$

$$156 \text{ litres} = 156000 \text{ ml}$$

$$= 156000 \text{ cm}^3$$

10. let x be hourly rate

$$15x + 8x + 12 \cdot \frac{4}{3}x = 429$$

$$23x + 16x = 429$$

$$39x = 429$$

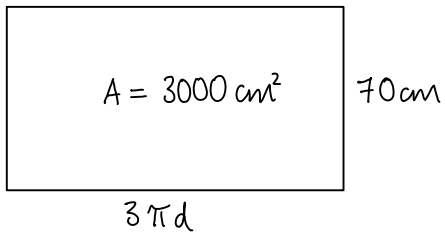
$$x = 11$$

$$\left(\frac{1}{3} \text{ more} = 1\frac{1}{3} \right)$$

$$= \frac{4}{3}$$

Tom is paid £11 per hour, £165 for 15 hours.

11.



$$A = db$$

$$3000 = 3\pi d \times 70$$

$$3000 = 210\pi d$$

$$d = \frac{3000}{210\pi}$$

$$d = 4.5 \text{ cm}$$

12. (a) $P(90, 1)$

(b) $4 \sin x^\circ - 3 = 0$

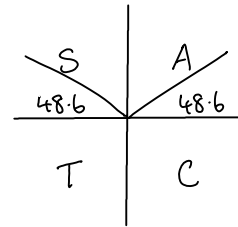
$4 \sin x^\circ = 3$

$\sin x^\circ = \frac{3}{4}$

acute angle $= 48.6^\circ$

$x^\circ = 48.6^\circ, 131.4^\circ$

$\Rightarrow x_0 = 48.6^\circ, x_2 = 131.4^\circ$



$180 - 48.6 = 131.4^\circ$

13.

$48 + 8t - t^2 = 0$

$(12 - t)(4 + t) = 0$

$12 - t = 0 \quad \text{or} \quad 4 + t = 0$

$t = 12$

$t = -4$

$t = 12 \text{ seconds}$