

$$\begin{aligned}
 \perp \text{ (a) Perimeter} &= 20 + 2 \times 35\text{m} + \frac{1}{2}\pi d \\
 &= 90\text{m} + \frac{1}{2} \times 3.14 \times 20\text{m} \\
 &= 90 + 31.4\text{m} \\
 &= 121.4\text{m}
 \end{aligned}$$

$$\begin{aligned}
 \text{Cost of fencing} &= 121.4 \times \pounds 1.25 \\
 &= \underline{\underline{\pounds 151.75}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) Area} &= 20 \times 35 + \frac{1}{2}\pi r^2 \\
 &= 700\text{m}^2 + \frac{1}{2} \times 3.14 \times 10^2 \\
 &= 857\text{m}^2
 \end{aligned}$$

$$\begin{aligned}
 \text{Cost of potatoes} &= 857 \times \pounds 0.15 \\
 &= \underline{\underline{\pounds 128.55}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(c) Selling Price} &= 120 \times \pounds 2.50 \\
 &= \pounds 300
 \end{aligned}$$

$$\begin{aligned}
 \text{Profit on potatoes} &= \pounds 300 - \pounds 128.55 \\
 &= \underline{\underline{\pounds 171.45}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(d) \% Profit} &= \frac{171.45}{128.55} \times \frac{100}{1} \% \\
 &= \underline{\underline{133.4\%}} \text{ (to 1 d.p.)} = \underline{\underline{133\%}} \text{ (to 3 s.f.)}
 \end{aligned}$$

$$\begin{aligned}
 \text{(e) Cost of seed + fencing} &= \pounds 280.30 \\
 \text{Yes, overall profit of} & \pounds 300 - \pounds 280.30 \\
 &= \pounds 19.70
 \end{aligned}$$

$$\begin{aligned}
 \% \text{ overall profit} &= \frac{19.70}{280.30} \times \frac{100}{1} \% \\
 &= \underline{\underline{7.03\%}} \text{ (to 3 s.f.)}
 \end{aligned}$$

$$\begin{aligned}
 \underline{2} \text{ (a)} \quad V &= \pi r^2 h \\
 &= 3.14 \times 27.5 \times 27.5 \times 120 \text{ cm}^3 \\
 &= 284\,955 \text{ cm}^3 \text{ (285099 cm}^3\text{)} \\
 &= \frac{284.96 \text{ Litres (to 2 d.p.)}}{285.099 \text{ Litres}} = \frac{280 \text{ L (to 2 s.f.)}}{290 \text{ L}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) Surface Area} &= 2\pi r^2 + 2\pi r h \\
 &= 2 \times 3.14 \times 27.5^2 + 2 \times 3.14 \times 27.5 \times 120 \\
 &= 4749.25 \text{ cm}^2 + 20724 \text{ cm}^2 \\
 &= \underline{\underline{25\,473.25 \text{ cm}^2}} \\
 &= \underline{\underline{25\,000 \text{ cm}^2}} \text{ (to 2 s.f.)}
 \end{aligned}$$

$$\begin{aligned}
 \underline{3} \text{ (a)} \quad 4x - 20 &= 15 - 3x \\
 7x &= 35 \\
 x &= \underline{\underline{5}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b)} \quad 3(2x + 4) &= 2(x - 4) \\
 6x + 12 &= 2x - 8 \\
 4x &= -20 \\
 x &= \underline{\underline{-5}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(c)} \quad 2(3 - 2x) &= 4 - (2 - 4x) \\
 6 - 2x &= 4 - 2 + 4x \\
 -6x &= -4 \\
 x &= \underline{\underline{\frac{2}{3}}}
 \end{aligned}$$

$$\text{(d)} \quad \frac{3x}{5} - \frac{x}{4} = \frac{7}{10}$$

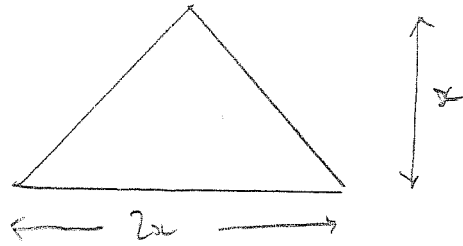
$$20 \times \frac{3x}{5} - 20 \times \frac{x}{4} = 20 \times \frac{7}{10}$$

$$12x - 5x = 14$$

$$7x = 14$$

$$x = \underline{\underline{2}}$$

4



Let height be x cm

$$\begin{aligned} \text{Area} &= \frac{1}{2}bh \\ &= \frac{1}{2} \times 2x \times x \\ &= x^2 \end{aligned}$$

$$\begin{aligned} \text{but Area} &= 36 \text{ cm}^2 \\ \Rightarrow x^2 &= 36 \\ x &= 6 \end{aligned}$$

$$\begin{aligned} \text{length} &= 12 \text{ cm} \\ \text{height} &= 6 \text{ cm} \end{aligned}$$

5 (a) 3, 7, 11, 15, 19, 23, 27, 31

$$n^{\text{th}} \text{ term} = 4n - 1$$

(b) -3, 3, 9, 15, 21, 27, 33, 39

$$n^{\text{th}} \text{ term} = 6n - 9$$

(c) 4, 7, 12, 19, 28, 39, 52

$$n^{\text{th}} \text{ term} = n^2 + 3$$

6 (a)

P	2	3	4	5	6		20
C	2	4	6	<u>8</u>	<u>10</u>		<u>38</u>

(b) $C = 2P - 2$

(c) $C = 2P - 2$, $P = 50$
 $= 2 \times 50 - 2$
 $= 98$

(d) $C = 146 \Rightarrow 2P - 2 = 146$

$$2P = 148$$

$$P = \underline{74} \text{ posts needed}$$

7 (a) $\text{Cost} = 5 \times 26 + 4 \times 210$
 $= 230 + 240$
 $= \underline{270}$

(b) $C = 6x + 10y$

