

N5 Unit 1 Solutions

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Q1 Multiplier = $100\% + 4\% = 104\% = 1.04$

$$\begin{aligned}\text{Vehicles} &= 2.69 \times 1.04^3 \\ &= 3.025... \\ &= \underline{\underline{3.03 \text{ million}}}\end{aligned}$$

Q2 Multiplier = $100\% - 20\% = 80\% = 0.8$

$$\begin{aligned}\text{Fat content} &= 90 \times 0.8^3 \\ &= \underline{\underline{46.08 \text{ g}}}\end{aligned}$$

The company will not achieve their aim as $46.08 > 45 \text{ g}$

Q3 Multiplier = $100\% - 20\% = 80\% = 0.8$

$$\text{Year 2} = 750000 \times 0.8^2 = 480000$$

$$\text{Year 3} = 750000 \times 0.8^3 = 384000$$

$$\text{Year 4} = 750000 \times 0.8^4 = 307200$$

The machinery should be replaced after 4 years
since $\pounds 307200 < \pounds 375000$.

Q4 Multiplier = 0.72

$$72\% = 1296$$

$$\text{Total people who sat test} = 1296 \div 0.72 = 1800$$

$$\text{The number of people who failed was } 1800 - 1296 = \underline{\underline{504}}$$

Q5 Multiplier = $100\% - 16\% = 84\% = 0.84$

$$84\% = \pounds 3780$$

$$\begin{aligned}\text{Value last year} &= 3780 \div 0.84 \\ &= \underline{\underline{\pounds 4500}}\end{aligned}$$

Pythagoras

Q1/ By Pythagoras

$$\begin{aligned}a^2 &= c^2 - b^2 \\&= 19^2 - 18.2^2 \\&= 29.76\end{aligned}$$

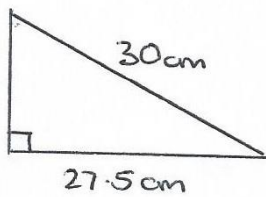
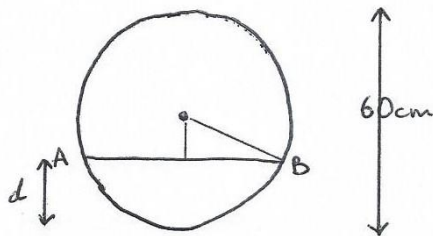
$$\begin{aligned}(\sqrt{}) \quad a &= 5.455 \dots \\&= 5.46 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{So Circumference} &= \pi \times 10.92 \\&= 34.306 \dots \\&= \underline{\underline{34.31 \text{ m}}}\end{aligned}$$

$$\begin{array}{r|l} \text{Q2/} & 110^2 & 90^2 + 60^2 \\ & 12100 & 8100 + 3600 \\ & 12100 & 11700 \end{array}$$

Since $110^2 \neq 90^2 + 60^2$ the slab is not right angled by the Converse of Pythagoras.

Q3



$$\begin{aligned}\text{By Pythagoras} \\a^2 &= c^2 - b^2 \\&= 30^2 - 27.5^2 \\&= 143.75 \\(\sqrt{}) \quad a &= 11.989 \dots \\&= 11.99 \text{ cm}\end{aligned}$$

$$\text{Depth} = 30 - 11.99 = \underline{\underline{18.01 \text{ cm}}}$$

$$\text{b) Depth} = 30 + 11.99 = \underline{\underline{41.99 \text{ cm}}}$$

Removing Brackets

Q1 $(2x-5)(x^2+3x-7)$

$$= 2x^3 + 6x^2 - 14x - 5x^2 - 15x + 35$$

$$= \underline{2x^3 + x^2 - 29x + 35}$$

Q2 $(3x-2)(2x^2+x+5)$

$$= 6x^3 + 3x^2 + 15x - 4x^2 - 2x - 10$$

$$= \underline{6x^3 - x^2 + 13x - 10}$$

Q3 $(3x+1)(x^2-5x+4)$

$$= 3x^3 - 15x^2 + 12x + x^2 - 5x + 4$$

$$= \underline{3x^3 - 14x^2 + 7x + 4}$$

Q4 $x(x-1)^2$

$$= x[(x-1)(x-1)]$$

$$= x[x^2 - x - x + 1]$$

$$= x[x^2 - 2x + 1]$$

$$= \underline{x^3 - 2x^2 + x}$$

Q5 $(2x-1)(x+4)$

$$= 2x^2 + 8x - x - 4$$

$$= \underline{2x^2 + 7x - 4}$$

Q6 $(2x+3)^2 - 3(x^2-6)$

$$= (2x+3)(2x+3) - 3(x^2-6)$$

$$= 4x^2 + 6x + 6x + 9 - 3x^2 + 18$$

$$= \underline{x^2 + 12x + 27}$$

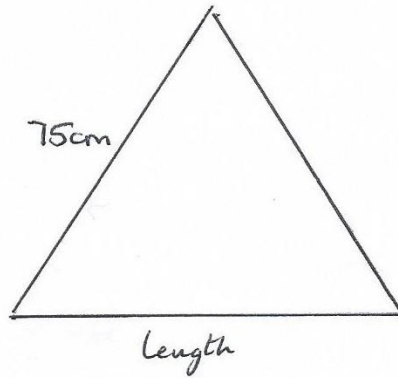
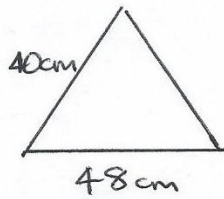
Q7 $(x+2)(x-5) - 9x$

$$= x^2 - 5x + 2x - 10 - 9x$$

$$= \underline{x^2 - 12x - 10}$$

Similarity

Q1/



$$\text{l.s.f (enlargement)} = \frac{75}{40}$$

$$\text{Length} = \frac{75}{40} \times 48$$

$$= 90$$

The board meets Mick's requirements
since 90cm > 80cm

Q2/

$$\text{l.s.f (enlargement)} = \frac{10}{4}$$

$$\text{a.s.f (enlargement)} = \left(\frac{10}{4}\right)^2$$

$$\text{Area} = \left(\frac{10}{4}\right)^2 \times 18$$

$$= \underline{\underline{112.5 \text{ cm}^2}}$$

Q3/

$$\text{l.s.f (enlargement)} = \frac{9}{6}$$

$$\text{v.s.f (enlargement)} = \left(\frac{9}{6}\right)^3$$

$$\text{Volume} = \left(\frac{9}{6}\right)^3 \times 30$$

$$= \underline{\underline{101.25 \text{ ml}}}$$

Factorising

$$\begin{aligned} \text{Q1/ } & x^2 - 4y^2 \\ & = \underline{(x+2y)(x-2y)} \end{aligned}$$

$$\begin{aligned} \text{Q2/ } & 4x^2 - y^2 \\ & = \underline{(2x+y)(2x-y)} \end{aligned}$$

$$\begin{aligned} \text{Q3/ } & 5x^2 - 45 \\ & = 5(x^2 - 9) \\ & = \underline{5(x+3)(x-3)} \end{aligned}$$

$$\begin{aligned} \text{Q4/ } & x^2 + x - 6 \\ & = \underline{(x+3)(x-2)} \end{aligned} \quad \begin{array}{l} \text{oo} \text{ } x - 6 \\ + 1 \end{array}$$

$$\begin{aligned} \text{Q5/ } & x^2 - 10x + 18 \\ & = (x-5)^2 - 5^2 + 18 \\ & = (x-5)^2 - 25 + 18 \\ & = \underline{(x-5)^2 - 7} \end{aligned}$$