

$$\begin{aligned}
 1. \quad & 2\frac{1}{3} + \frac{4}{5} \\
 &= \frac{7}{3} + \frac{4}{5} \\
 &= \frac{35}{15} + \frac{12}{15} \\
 &= \frac{47}{15} = \underline{\underline{3\frac{2}{15}}}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & (3x+1)(x-1) + 2(x^2-5) \\
 &= 3x^2 - 3x + x - 1 + 2x^2 - 10 \\
 &= \underline{\underline{5x^2 - 2x - 11}}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & 4x + 5y = -3 \quad - (1) \\
 & 6x - 2y = 5 \quad - (2)
 \end{aligned}$$

Sub $x = \frac{1}{2}$ into (1)

$$\begin{aligned}
 4\left(\frac{1}{2}\right) + 5y &= -3 \\
 2 + 5y &= -3 \\
 5y &= -5 \\
 \underline{\underline{y = -1}}
 \end{aligned}$$

$$\begin{aligned}
 (1) \times 2 \Rightarrow & 8x + 10y = -6 \\
 (2) \times 5 \Rightarrow & 30x - 10y = 25 \\
 \text{Add } & \underline{38x = 19} \\
 & \underline{\underline{x = \frac{1}{2}}}
 \end{aligned}$$

$$\underline{\underline{\left(\frac{1}{2}, -1\right)}}$$

$$4. \quad v = \begin{pmatrix} 6 \\ -4 \\ 3 \end{pmatrix} - \begin{pmatrix} 1 \\ 5 \\ 1 \end{pmatrix} = \underline{\underline{\begin{pmatrix} 5 \\ -9 \\ 2 \end{pmatrix}}}$$

$$\begin{aligned}
 5. \quad & x^2 - 11x + 24 = 0 \\
 & (x-8)(x-3) = 0 \\
 & \underline{\underline{x=8}} \quad \text{or} \quad \underline{\underline{x=3}}
 \end{aligned}$$

$$\begin{aligned}
 6. \quad & \underline{\underline{a=5}} \\
 & \underline{\underline{b=4}}
 \end{aligned}$$

$$7. a) \quad A(8, 14) \quad B(12, 20)$$

$$m_{AB} = \frac{20-14}{12-8} = \frac{6}{4} = \frac{3}{2}$$

$$y-b = m(x-a)$$

$$y-14 = \frac{3}{2}(x-8) \Rightarrow y-14 = \frac{3}{2}x - 12 \Rightarrow y = \frac{3}{2}x + 2$$

$$\text{so } \underline{\underline{p = \frac{3}{2}d + 2}}$$

7b.
$$P = \frac{3}{2}(5) + 2$$

$$= \frac{15}{2} + 2$$

$$= 7.5 + 2$$

$$= 9.5$$
 so cost is £9.50

8.
$$f(x) = 2x^2 + 4x + 5$$

$$a = 2, b = 4, c = 5$$

$$b^2 - 4ac$$

$$= 16 - 4(2)(5)$$

$$= 16 - 40$$

$$= \underline{-24} \quad \text{so } \underline{\text{no real roots}} \quad \left(\begin{array}{l} \text{as } b^2 - 4ac < 0 \\ -24 < 0 \end{array} \right)$$

9.
$$360 \div 10 = 36^\circ$$
 so $\angle JKL = 36^\circ$ (exterior angle)

$$\begin{array}{r} 36 \\ +17 \\ \hline 53 \end{array} \quad \text{so } \angle KJL = \begin{array}{r} 180 \\ -53 \\ \hline 127^\circ \end{array}$$

10.
$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$(XY)^2 = 10^2 + 8^2 - 2(10)(8)\left(\frac{1}{8}\right)$$

$$(XY)^2 = 100 + 64 - 20$$

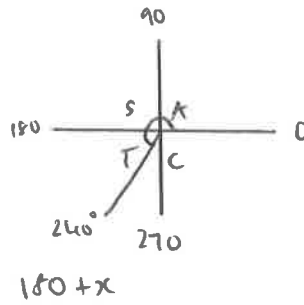
$$(XY)^2 = 144$$

$$XY = \sqrt{144}$$

$$XY = \underline{\underline{12 \text{ cm}}}$$

11. $\frac{a}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}} = \frac{a\sqrt{b}}{b} = \underline{\underline{\frac{3\sqrt{b}}{2}}}$

12. $\cos 60^\circ = 0.5$
 $\cos 240^\circ = -\cos 60$
 $= \underline{\underline{-0.5}}$



13. $\underline{\underline{B(4, 8, 5)}}$ $\underline{\underline{C(6, 8, 0)}}$

14. $y = g\sqrt{x} + h$
 $g\sqrt{x} = y - h$
 $\sqrt{x} = \frac{y - h}{g}$
 $x = \underline{\underline{\left(\frac{y - h}{g}\right)^2}}$

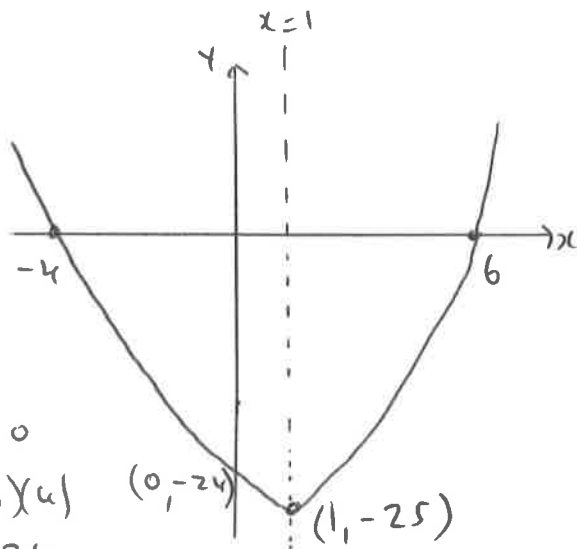
15. $\left(\frac{2}{3} p^4\right)^2$
 $= \left(\frac{2}{3}\right)^2 p^8$
 $= \underline{\underline{\frac{4}{9} p^8}}$

16. $y = (x - 6)(x + 4)$

Roots when $y = 0 \Rightarrow (x - 6)(x + 4) = 0$

$x = 6$ or $x = -4$ Roots are $(6, 0)$ $(-4, 0)$

axis of symmetry = $\frac{6 + (-4)}{2}$
 $= \frac{2}{2} = 1$



When $x = 0$
 $y = (-6)(4)$
 $= -24$
 $(0, -24)$

T.P when $x = 1$
 $y = (1 - 6)(1 + 4)$
 $= (-5)(5)$
 $= -25$
 $(1, -25)$

$$17. \quad V_{\text{pyramid}} = \frac{1}{3} Ah \quad A_{\text{Base}} = 6 \times 6 = 36$$

$$138 = \frac{1}{3}(36)h$$

$$138 = 12h$$

$$12h = 138$$

$$h = \frac{138}{12} = \underline{\underline{11\frac{1}{2} \text{ cm}}}$$

$$18. \quad \sin x \cos x \tan x$$

$$= \sin x \cos x \frac{\sin x}{\cos x}$$

$$= \sin x \sin x$$

$$= (\sin x)^2$$

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

$$19 \text{ a) } x^2 - 6x - 81$$

$$= (x^2 - 6x + 9) - 9 - 81$$

$$= \underline{\underline{(x-3)^2 - 90}}$$

$$\text{ii) when } x-3=0$$

$x=3$ is axis of symmetry

$$\text{b) } x^2 - 6x - 81 = 0$$

$$a=1$$

$$b=-6$$

$$c=-81$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{6 \pm \sqrt{(-6)^2 - 4(1)(-81)}}{2}$$

$$x = \frac{6 \pm \sqrt{36 + 324}}{2} = \frac{6 \pm \sqrt{360}}{2}$$

$$x = \frac{6 \pm 6\sqrt{10}}{2}$$

$$x = \underline{\underline{3 \pm 3\sqrt{10}}}$$

$$\begin{aligned} & \sqrt{360} \\ &= \sqrt{36 \times 10} \\ &= \sqrt{36} \times \sqrt{10} \\ &= 6\sqrt{10} \end{aligned}$$

$$\text{So } \underline{\underline{d=3}} \text{ and } \underline{\underline{e=10}}$$