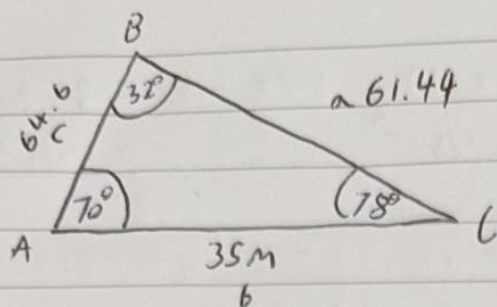


2)i



SOM COA

$$\frac{\sin(78)}{AB} = \frac{\sin(32)}{35} \quad \overline{AB} = \frac{\sin(78) \times \sin(32)}{35}$$

$$\frac{0.98 \times 0.015}{35} = \frac{\sin 35}{\sin(32) \sin(78)} = \overline{AB}$$

ii

$$\sin 35 \times \sin(78) = \overline{AB} = \underline{64.6m}$$

iii

$$a^2 + b^2 - 2ab \cos A \rightarrow a^2 = 35^2 + 64.6^2 - 2(35)(64.6) \cos(70)$$

$$a^2 = 35^2 + 64.6^2 - 2(35)(64.6) \cos(70) = \underline{61.44}$$

3)i) $\sin x = 0.67$

$$x = 42.07 \quad 180 - 42.07 = x = 137.93$$

ii) $\tan^2 x - 7 \tan x + 10 = 0$

4) $y = 5x^2 + 12x - 14 \rightarrow 5x^2 + 12x - 14 \quad 20x^2 + 48x - 56$

$$y = 4x^2 + 3x - 4 \quad 16x^2 + 12x - 16 \quad 20x^2 + 15x - 20$$

$$y = 4(2.3)^2 + 3(2.3) - 4$$

$$\underline{y = 24.06}$$

$$33x - 76 = 0$$

$$33x = -76 \quad 33x = -\frac{76}{33}$$

$$\underline{x = -\frac{76}{33} = -2.30}$$

5)i) $(3+7j) + (2-10j)$

$$\underline{(5-3j)}$$

ii) $3+7j - 2+10j$

$$\underline{(1+17j)}$$

iii) $\frac{3+7j}{2-10j} = \underline{(1.5-0.7j)}$

b) $7x^2 + 2x + 11 = 0$

6) i) $y = 9x^3 + 7x^2 - x + 4$

$$\frac{dy}{dx} = 27x^2 + 14x - 1$$

ii) $y = (2x+3)(3x-5)$

$$\frac{dy}{dx} = (2x+3) \cdot 3 + (3x-5) \cdot 2$$

$$= 6x + 9 + 6x - 10$$

$$= 12x - 1$$

iii) $y = 2 \ln x + \frac{5}{2}$

a) i) $\frac{3x-1}{5} = \frac{6x+5}{9} \rightarrow 9(3x-1) = 5(6x+5) \rightarrow 57x - 9 = 30x + 25 \rightarrow 27x = 34 \rightarrow x = \frac{34}{27}$
 $x = -11.33$

ii) $1 + \frac{5}{x} = \frac{-6}{x^2} \rightarrow x^2(1) + 5x = -6 \rightarrow x^2 + 5x = -6 \rightarrow x^2 + 5x + 6 = 0$
 $(x+2)(x+3) \rightarrow x^2 + 3x + 2x + 6 = x^2 + 5x + 6 = 0$
 $x = -2, x = -3$

iii) $2 \log(3x+1) = \log(x+3) + \log(x+7) \rightarrow (3x+1)^2 = (x+3)(x+7) \rightarrow 9x^2 + 12x + 1 = x^2 + 10x + 21$
 $9x^2 - 6x - 20 = 10x \rightarrow 8x^2 - 16x - 20 = 0 \rightarrow 8x^2 - 4x - 20 = 0$
 $4x^2 - 2x - 10 = 0 \rightarrow (2x+2)(2x-5) \rightarrow 4x^2 - 5x + 4x - 10 = 0$
 $x = \frac{-(-4) \pm \sqrt{(-4)^2 + 4(8)(-20)}}{2(8)} = \frac{-(-4) \pm \sqrt{16 - 640}}{16} \rightarrow \frac{-(-4) \pm \sqrt{-624}}{16}$

b) $8p^3q^2 - 4p^2q^3 + 2p^3q \rightarrow 8p^2 - 4p^2q - 4p^2q^2 + 2p^3$
 $2(4p^3q^2 - 2p^2q^3 + p^3q) \rightarrow 2p^2(4pq^2 - 2q^3 + pq) \rightarrow 2p^2q(4pq - 2q^2 + p)$

ii) $x^2 - y^2 \rightarrow x \times x - y \times y \rightarrow (x-y)(x+y) \rightarrow x^2 + xy - xy - y^2 \rightarrow x^2 - y^2$

c) i) $x^2 + 12x + 20 = 0 \rightarrow (x+10)(x+2) \rightarrow x^2 + 2x + 10x + 20$
 $x = -10, x = -2$

ii) $2x^2 + x - 15 = 0 \rightarrow (2x-5)(x+3) \rightarrow 2x^2 - 5x - 15x + 15 \rightarrow 2x^2 - 10x + 15$
 $x = -3, 2x = 5 \rightarrow x = \frac{5}{2} \rightarrow x = 2.5$

iii) $x^2 - 400 = 0 \rightarrow \sqrt{400} = 20 \rightarrow (x+20)(x-20) = x^2 - 20x + 20x - 400$
 $x = -20, x = 20$