

Question 1

A) $V_{min} = \sqrt{\frac{W}{S} \times \frac{2}{P} \times \frac{1}{C_L}}$

$$V_{min}^2 S = \frac{W}{P} \times \frac{2}{C_L}$$

$$S = \left(\frac{W \times 2 \times 1}{P \times C_L \times V_{min}^2} \right)$$

$$S = \left(\frac{490332 \times 2 \times 1}{0.41 \times 0.52 \times 200^2} \right)$$

$$S = 140.999 m^2$$

B) i) $\frac{8x-3}{5} = \frac{-5x+6}{-3}$

$$-3(8x-3) = 5(-5x+6)$$

$$-24x+9 = -25x+30$$

$$-24+25x = 30-9$$

$$x = 21$$

ii) $\frac{(4x-1)}{3} - \frac{x}{4} = \frac{(4x+3)}{2}$

~~multiply by 12~~

$$\frac{12(4x-1)}{3} - \frac{12x}{4} = \frac{12(4x+3)}{2}$$

$$4(4x-1) - 3x = 6(4x+3)$$

~~16x-4-3x=24x+18~~

$$16x-4-3x = 24x+18$$

$$13x-4 = 24x+18$$

$$-4-18 = 24x+13x$$

$$-22 = 37x$$

$$\frac{-22}{37} = x$$

$$-0.594 = x$$

iii) $2\log(5x+3) = \log(x+1) + \log(x+2)$

$$\log(5x+3)^2 = \log(x+1)(x+2)$$

$$(5x+3)(5x+3) = (x+1)(x+2)$$

$$25x^2 + 15x + 15x + 9 = x^2 + x + 2x + 2$$

$$25x^2 + 30x + 9 = x^2 + 3x + 2$$

$$25x^2 + 30x + 9 - x^2 - 3x - 2 = 0$$

$$24x^2 + 27x + 7 = 0$$

$$24x^2 + 27x + 7 = 0$$

$$ax^2 + bx + c$$

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

$$x = \frac{-27 \pm \sqrt{27^2 - 4 \times 24 \times 7}}{2 \times 24}$$

$$+ = \frac{-27 + 39}{48} = 0.41$$

$$- = \frac{-27 - 39}{48} = -0.72$$

$$\text{iv) } 7^x \times 3^{x+2} = 5^{x-1}$$

~~Q. 10) Solve the following equations~~
~~1) $27R^2 + 24R + 5 = 0$~~
~~2) $81Q^2 - 144Q^2$~~
~~3) $x^2 + 9x + 8 = 0$~~

~~Q. 11) Solve the following equations~~

c) i) $27R^2 + 24R + 5 = 0$
 $(9R + 5)(3R + 1)$
 $27R^2 + 9R + 15R + 5$
 $27R^2 + 24R + 5$

ii) $81Q^2 - 144Q^2$
 $9(3Q + 4Q)(3Q - 4Q)$
 $(27Q + 36Q)(3Q - 4Q)$
 $81Q^2 - 144Q^2$

~~Q. 12) Solve the following equations~~

iii)

d) i) $x^2 + 9x + 8 = 0$
 $(x + 8)(x + 1) = 0$
 $x^2 + x + 8x + 8 = 0$

$$x + 8 = 0$$

$$x = -8$$

$$x + 1 = 0$$

$$x = -1$$

$$\text{ii)} \quad 12x^2 - 5x - 3 = 0$$

$$(4x-3)(3x+1) = 0$$

~~addition~~

$$12x^2 - 5x - 3 = 0$$

$$4x - 3 = 0$$

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

$$4x + 1 = 0$$

$$x = -\frac{1}{4}$$

$$\text{ii)} \quad 2x^2 + 17x = -30$$

$$2x^2 + 17x + 30 = 0$$

$$(2x+5)(x+6) = 0$$

$$2x^2 + 12x + 5x + 30 = 0$$

$$2x + 5 = 0$$

$$x = -\frac{5}{2}$$

$$x + 6 = 0$$

$$x = -6$$

$$\text{iv)} \quad x^2 - 256 = 0$$

$$x^2 - 256 + 256 = 0 + 256$$

$$x^2 = 256$$

$$x = \sqrt{256}$$

$$x = 16$$

$$x = 16$$

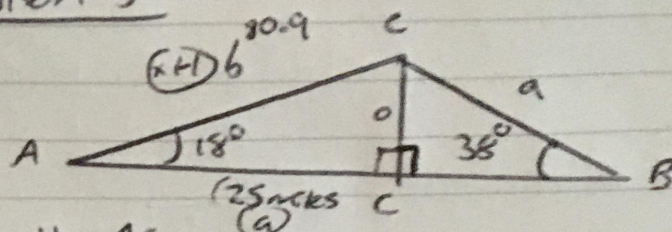
$$x = -16$$

Question 3

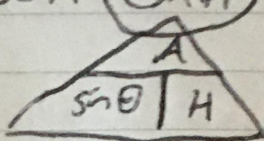
e)

Find:

- length AC
- length BC



i) SOH (CAH) TOA



$$\sin \theta = \frac{A}{H}$$

$$H = \frac{A}{\sin \theta}$$

$$H = \frac{20}{\sin(18)}$$

$$H = \frac{20}{\sin(18)} = 64.7 \text{ miles}$$

$$\text{ii) } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{CB}{\sin 25} = \frac{64.7}{\sin 38}$$

$$CB = \frac{64.7 \times \sin(25)}{\sin(38)}$$

$$BC = \frac{64.7 \times \sin(25)}{\sin(38)}$$

$$BC = 44.4 \text{ miles}$$