

Question 1

A)

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

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

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

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

$$S = 140.999 \text{ m}^2$$

B)

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

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

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

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

$$x = 21$$

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

$$\text{Multiply by 12}$$

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

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

$$\text{Crossed out line}$$

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

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

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

$$-22 = 37x$$

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

$$37$$

$$-0.594 = x$$

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

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

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

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

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

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

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