

Exam

Question ONE

$$\textcircled{a} \quad V_{min} = \sqrt{\frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3}} \\ (V_{min})^2 = \frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3} \\ \frac{(V_{min})^2}{\frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3}} = \frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3} \\ \frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3} = \frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3}$$

$\textcircled{b}$

$$\textcircled{i} \quad 8x - 3 = \frac{-5x + 6}{-3}$$

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

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

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

$$x = 21$$

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

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

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

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

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

$$-11x = 22$$

$$x = -2$$

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

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

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

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

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

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

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

$$x = \frac{-27 \pm \sqrt{729 - 672}}{48}$$

$$x = \frac{-27 \pm \sqrt{57}}{48}$$

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$$x = -4052$$

$\textcircled{iv}$

$$7^x + 3^{x+2} = 5^{x-1}$$

$$7^x \cdot 3^2 \cdot 3^x = 5^x \cdot 5^{-1}$$

$$7^x \cdot 3^2 \cdot 3^x = 5^x \cdot \frac{1}{5}$$

$$(7 \cdot 3)^2 \cdot 9 = \frac{1}{5} \cdot 5^x$$

$$21^2 \cdot 9 = \frac{1}{5} \cdot 5^x$$

$$9 \cdot 21^2 = \frac{1}{5} \cdot 5^x$$

$$9 \cdot 21^2 = \frac{1}{5} \cdot 5^x$$

$$\left(\frac{21}{5}\right)^x = \frac{1}{45}$$

$$x = -\log_{\frac{21}{5}}(45)$$

$$x = 2.65$$