

**Fortify Sample Exam A****SPECIALIST MATHEMATICS****Exam 1 Solutions****Question 1a.**

$$\frac{1}{16} \operatorname{cis} \left(\frac{7\pi}{12} \right)$$

Question 1b.

$$z = -1 \pm 2i$$

Question 2

$$95\% \text{ CI} = 15 \pm \frac{7}{75}$$

Question 3

$$y = \frac{\sqrt{3}}{2}x - \frac{\pi\sqrt{3}}{8} + \frac{\pi}{6}$$

Question 4

$$\sqrt{5 + 16e^4} \text{ ms}^{-2}$$

Question 5

$$V = \pi(9 \log_e(3) - 8) \text{ units}^3$$

Question 6

$$2\mathbf{i} - 2\mathbf{j} + \mathbf{k}$$

Question 7

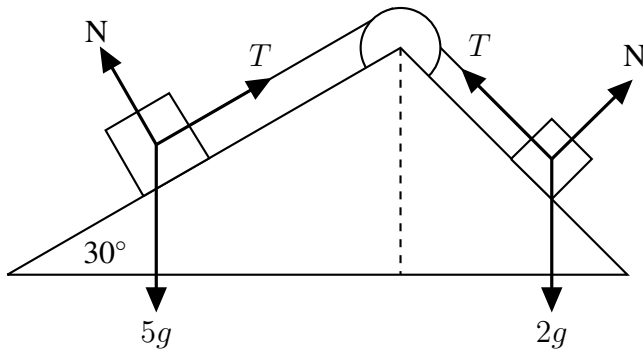
$$Q = \frac{20}{2^{\frac{t}{5}}}$$

Question 8

$$A = \frac{e}{e^2 - 1} \text{ units}^2$$

Question 9

$$(-1, 1)$$

Question 10a.**Question 10b.**

$$a = g \left(\frac{5}{14} - \frac{\sqrt{2}}{7} \right) \text{ ms}^{-2} \text{ or } a = \frac{g(5 - 2\sqrt{2})}{14} \text{ ms}^{-2}$$

Question 10c.

$$T = \frac{5g}{7}(1 + \sqrt{2}) \text{ N}$$