

SOLUTIONS

Fortify Sample Exam 1A

Question 1

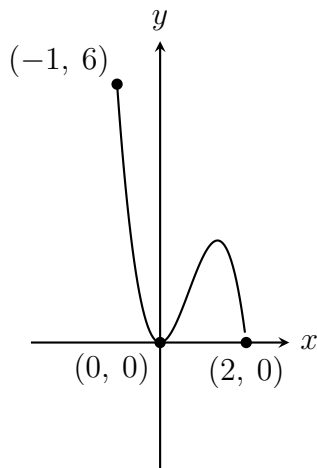
a. $\frac{dy}{dx} = 2 + 2\log_e(x)$

b. $h'\left(\frac{\pi}{18}\right) = 3\sqrt{3}e$

Question 2

$a = 3, b = \frac{\sqrt{3}}{2}, c = 4$

Question 3



Question 4

$a = 3, b = 2$

Question 5

$\Pr(\text{Healthy on Tuesday}) = 0.73$

Question 6

a. Check with your teacher.

b. $\Pr\left(X \geq \frac{1}{2} \mid X \geq \frac{1}{3}\right) = 2 - \sqrt{2}$

Question 7

a. $h(x) = 2x, \text{ Domain} = \mathbb{R}^-$

b. $h^{-1}(24) = 12$

Question 8

a. $\frac{dy}{dx} = 2\sin(x) + 2x\cos(x)$

b. $A = -\frac{1}{24}(-16\sqrt{3}\pi - 12 - 9\sqrt{2}\pi + 12\sqrt{2})$

Question 9

a. Peak = 80 metres above ground level

b. $EF = (20\sqrt{3} + 40)$ metres long

c. $t = \frac{8}{5}$ seconds

Question 10

a. $h = 9 - \frac{3r}{2}$

b. $V = 3\pi r^2 - \frac{\pi r^3}{2}$

c. Max volume = $16\pi \text{ m}^3$