

SOLUTIONS

Fortify Sample Exam 1B

Question 1

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

b. $\frac{dy}{dx} = \frac{2x^3 e^{\frac{x}{3}}}{3} + 6x^2 e^{\frac{x}{3}}$

Question 2

$m = \frac{9}{4}$

Question 3

a. Height = 80 m

b. Horizontal distance = $4\sqrt{10}$ m

Question 4

a. $\Pr(X < 8) = 0.5$

b. $a = \frac{3}{4}$

Question 5

a. $a = 6\sqrt{3}$

b. $\left(\frac{\pi}{6}, \sqrt{3}\right)$ and $\left(\frac{7\pi}{6}, -\sqrt{3}\right)$

Question 6

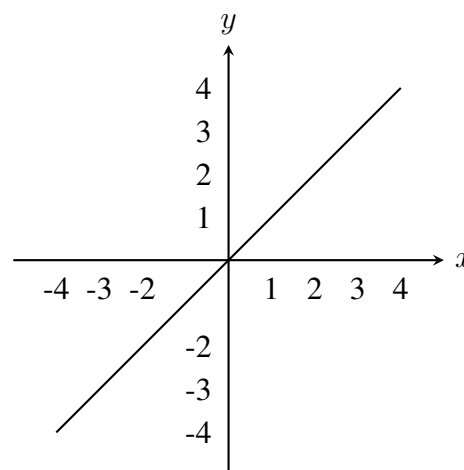
a. $\Pr(X = 3) = \frac{343}{1000}$

b. $\Pr(X = 1) = \frac{189}{1000}$

Question 7

a. $g^{-1} : (2, \infty) \rightarrow R, g^{-1}(x) = \frac{1}{3} \log_e(x-2)$

b.



c. $g(g^{-1}(3x)) = \frac{6x-3}{3x-2}$

Question 8

ai. $x = \frac{a}{2}$

aii. $a > \sqrt{2e}$

b. $a = \frac{e}{2}$

Question 9

$E(X) = 2 \log_e(2) - 1$