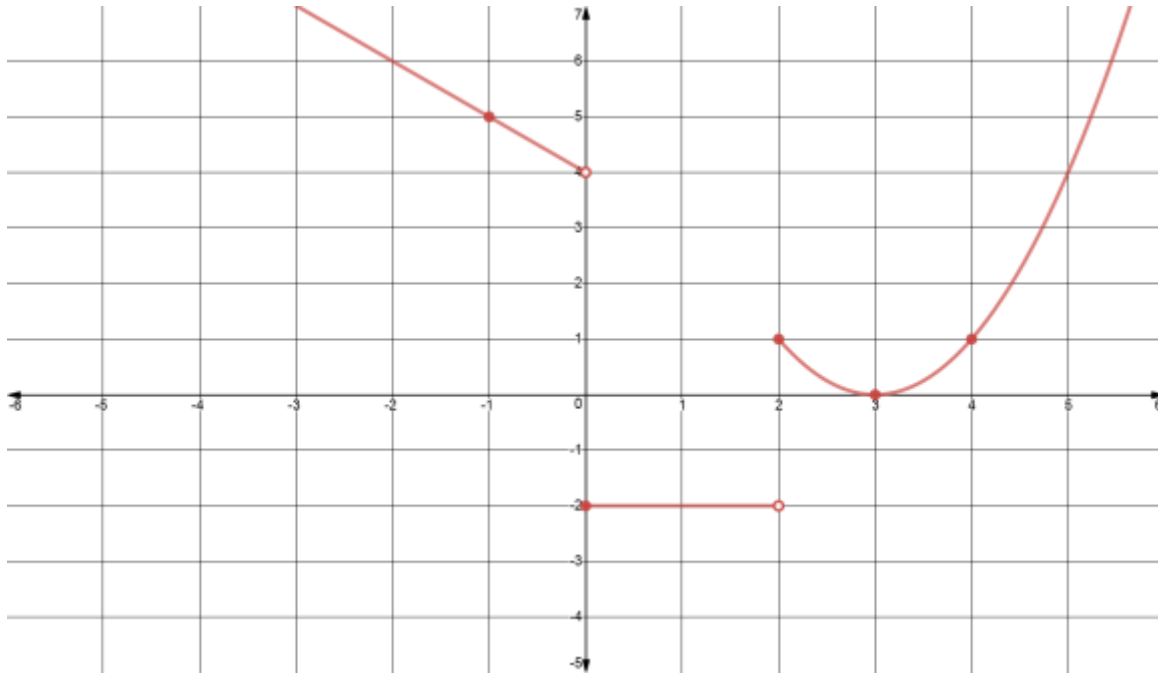


## Fall 2016 Final Exam Answer Key

1)  $x = -5$

2)



3) (a)  $\frac{6x+1}{9x+6}$

(b)  $\frac{x+1}{x-1}$

4)  $f^{-1}(x) = \frac{1}{x-2}$

5)  $D = (-\frac{7}{2}, 2) \cup (2, 6]$

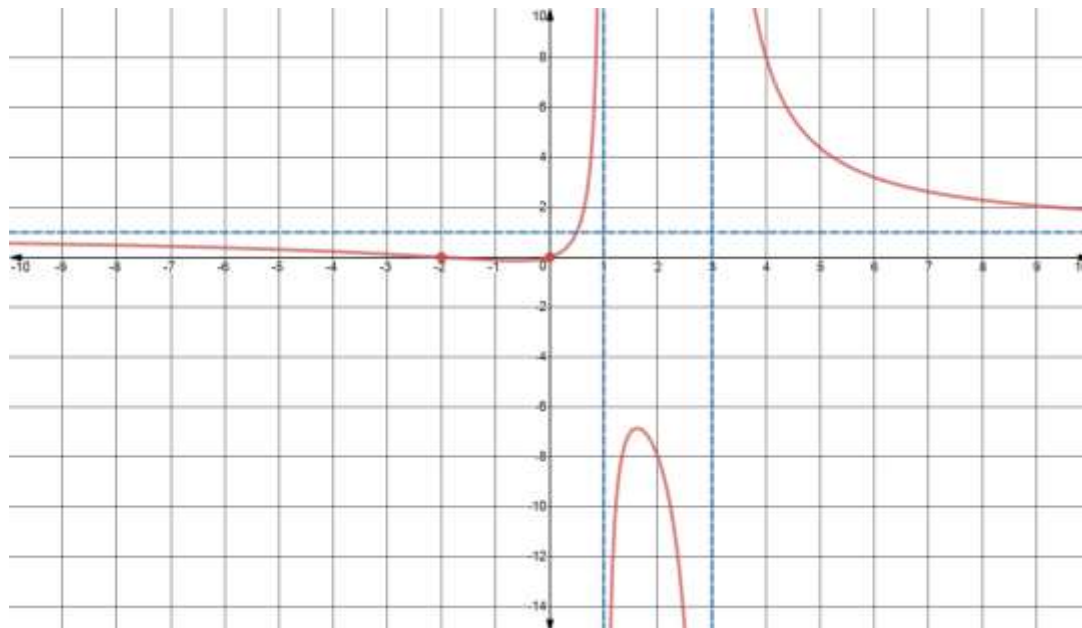
6) (a) 15 units

(b) \$40

7)  $\frac{7}{\sqrt{2+h} + \sqrt{2}}$

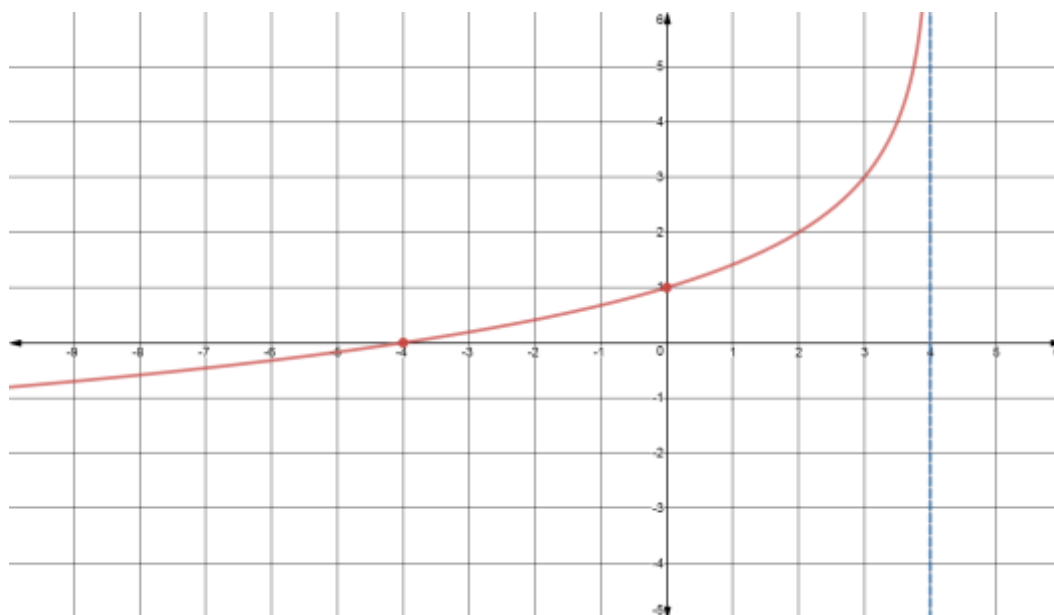
8)  $3i, -3i, \frac{1+i\sqrt{3}}{2}, \frac{1-i\sqrt{3}}{2}$

9)



10)  $x = \frac{\log(6)}{\log(3)} = \frac{\ln(6)}{\ln(3)} = \log_3(6)$

11)



12)  $D(t) = 13t$

13) (a)  $\frac{49}{e^3}$

(b)  $\frac{1}{20}$

14) 4500 people

15) (a)  $-\frac{1}{\sqrt{3}}$

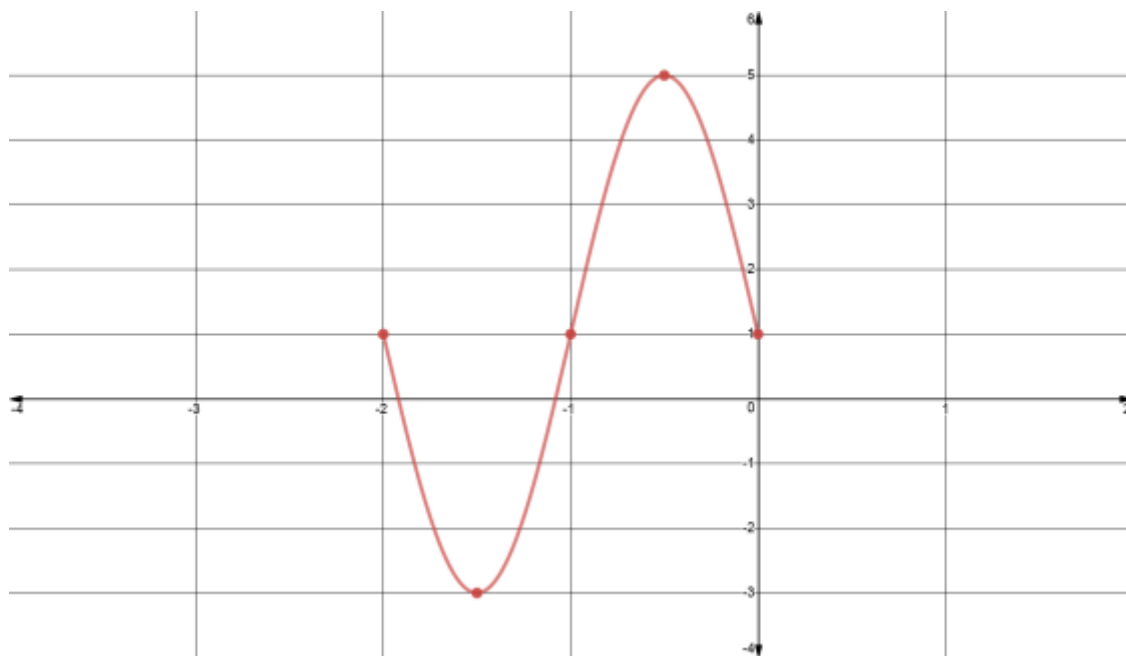
(b) 2

16) (a)  $\pi$

(b)  $\frac{\sqrt{19}}{9}$

17)  $\sin\left(\theta - \frac{\pi}{6}\right) = \frac{-5\sqrt{3} + \sqrt{39}}{16}$

18) The points plotted are  $(-2, 1)$ ,  $(-\frac{3}{2}, -3)$ ,  $(-1, 1)$ ,  $(-\frac{1}{2}, 5)$ ,  $(0, 1)$



19)

$$\begin{aligned}LHS &= \frac{\cos(2x)+1}{\sin(2x)} \\&= \frac{\cos^2 x - \sin^2 x + 1}{2 \sin x \cos x} \\&= \frac{\cos^2 x + 1 - \sin^2 x}{2 \sin x \cos x} \\&= \frac{\cos^2 x + \cos^2 x}{2 \sin x \cos x} \\&= \frac{2 \cos^2 x}{2 \sin x \cos x} \\&= \frac{\cos x}{\sin x} \\&= \cot x = RHS\end{aligned}$$

20)  $0, \pi, \frac{7\pi}{6}, \frac{11\pi}{6}$