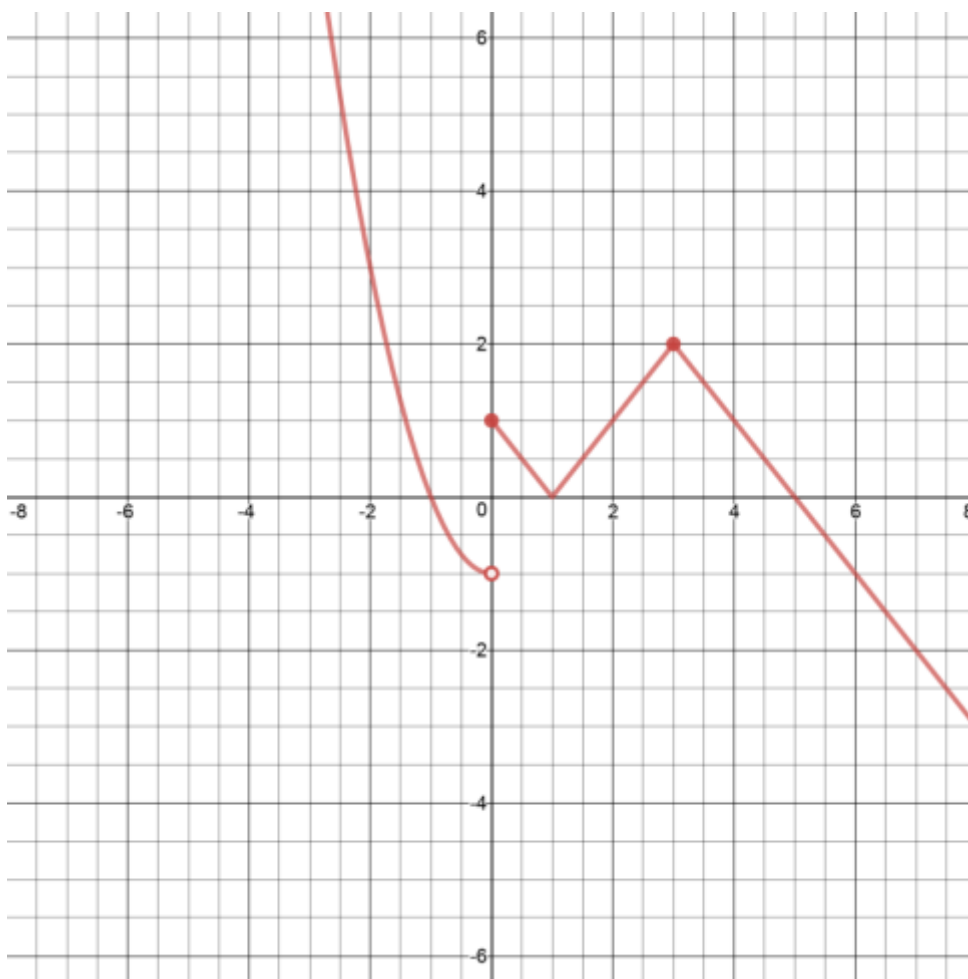


## Fall 2018 Final Exam Answer Key

1)



2) (a) 13

(b)  $f^{-1}(10) = \log_4(7) + 5$

3)  $D = (-\infty, -2) \cup (-2, 0) \cup (3, \infty)$

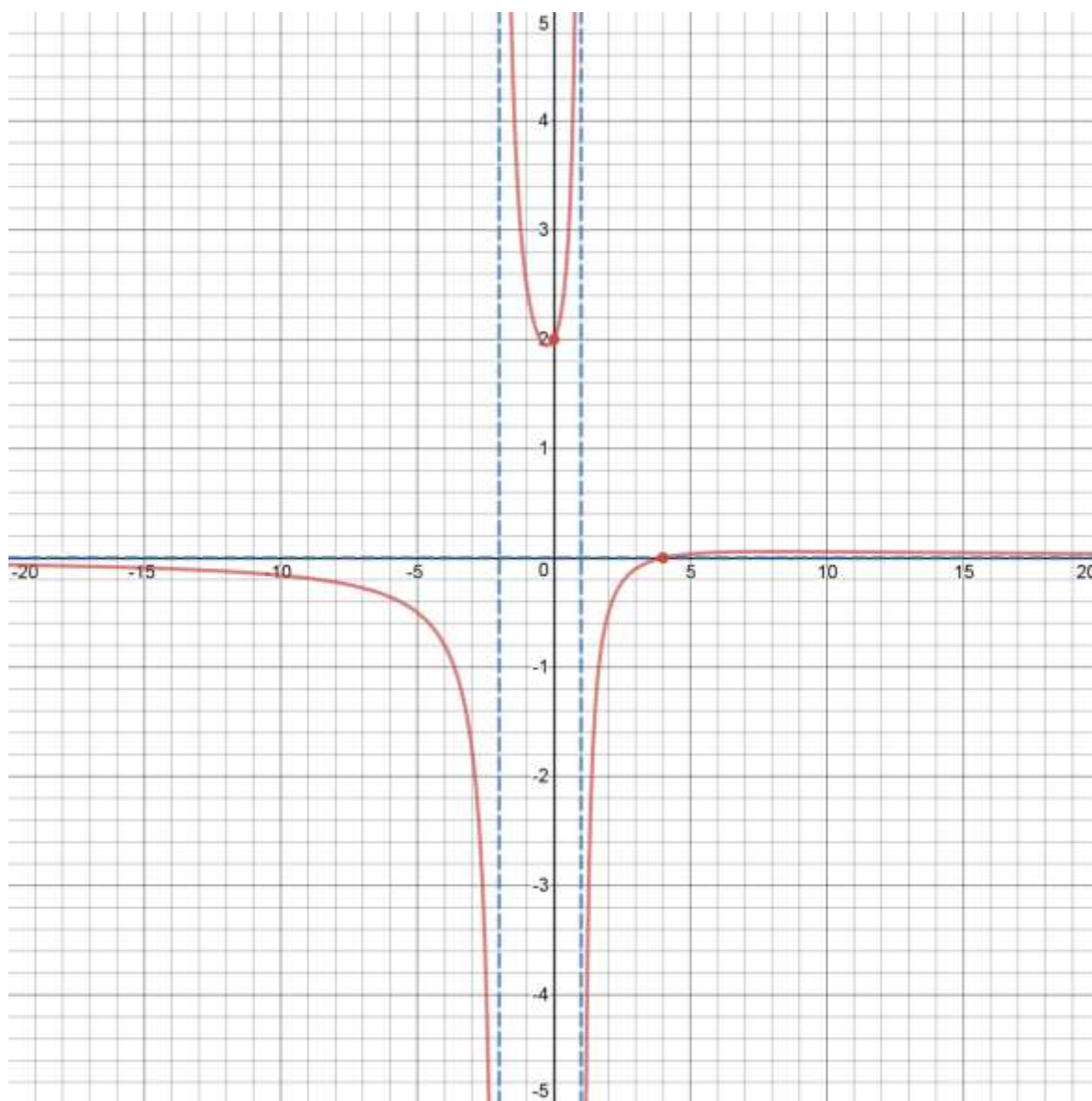
4)  $\frac{-1}{(a+h+5)(a+5)}$

5)  $S(x) = 2x^2 + \frac{400}{x}$

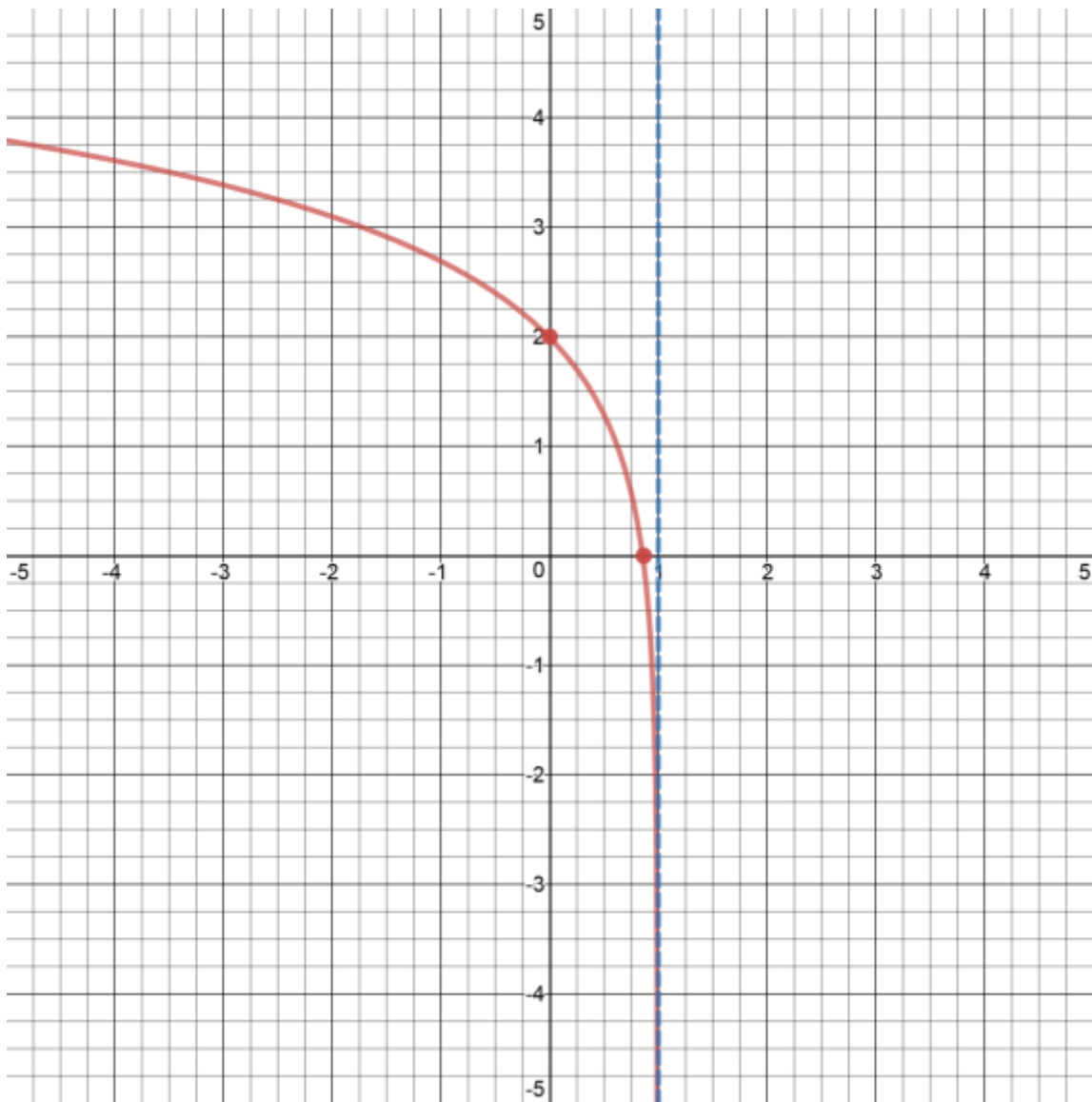
6) \$164

7)  $2 \pm i$

8)



9)



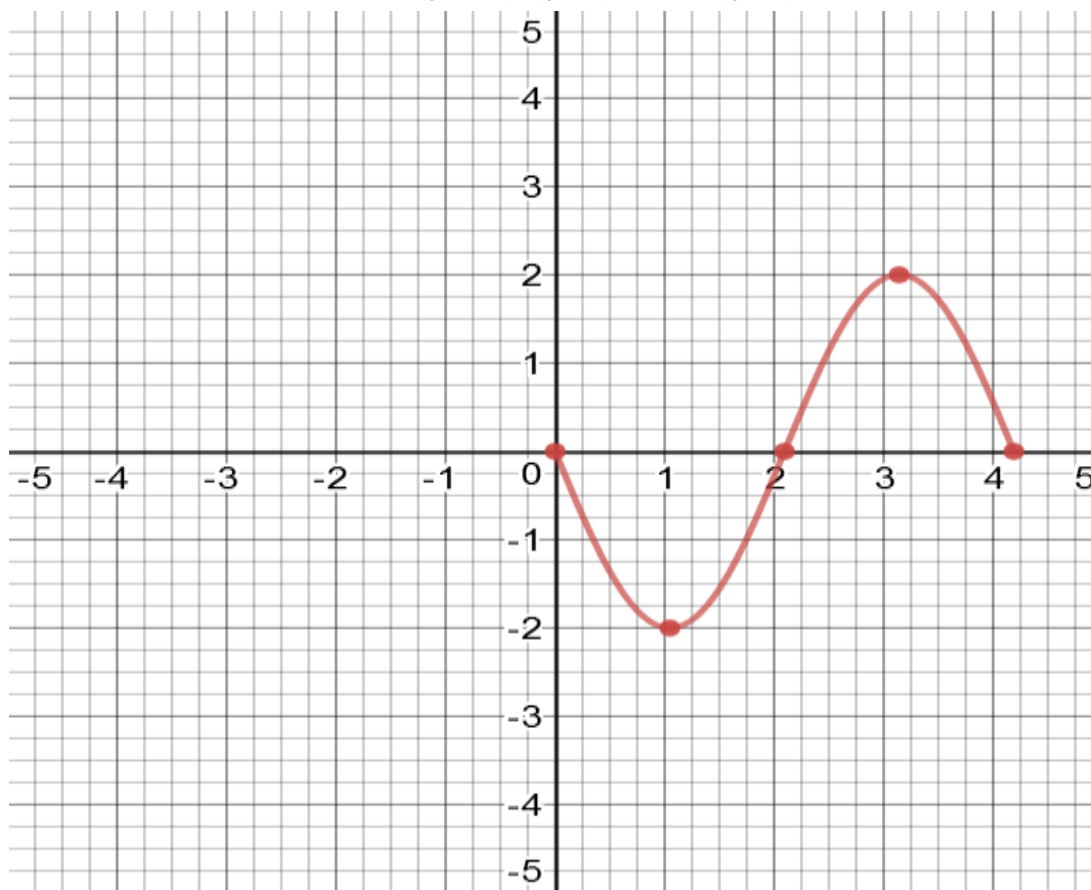
10) 80 ounces

11) 6

12) (a)  $\frac{1}{\sqrt{3}}$

(b)  $\frac{\pi}{4}$

13) The points plotted are  $(0, 0)$ ,  $(\frac{\pi}{3}, -2)$ ,  $(\frac{2\pi}{3}, 0)$ ,  $(\pi, 2)$ ,  $(\frac{4\pi}{3}, 0)$



14)

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

15)  $\frac{-3+4\sqrt{3}}{10}$

16)  $0, \pi$