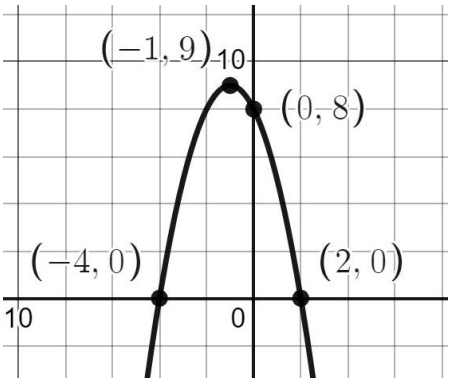
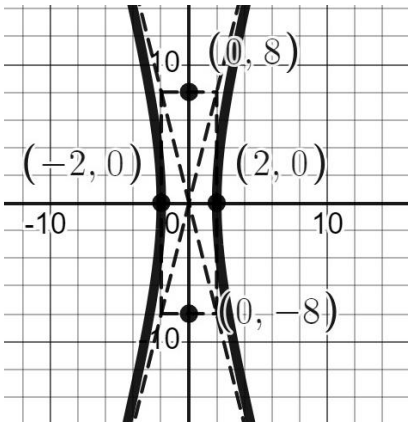
F23 MAT 1070 Final Exam Key

1. $y = -\frac{1}{2}x + \frac{5}{2}$
2. $x \in \{3,7\}$
3. $\left[\frac{2}{5}, \infty\right)$
4. a. $g(-6) = 4$
   b. $g(0) = 5$
5. The speed of the boat in still water is $\frac{15}{2}$ or 7.5 mph. The speed of the current is $\frac{5}{2}$ or 2.5 mph.
6. a. 9
   b. 2
   c. $\sqrt{9 - 2x^2}$
7. $2x + h - 2$
8. a. Domain: $(-\infty, \infty)$
   b. Range: $(-\infty, 4]$
   c. Decrease: $(2,3), (5, \infty)$
   d. $g(0) = 4$
   e. $x \in \{2, 4, 8\}$
9. $x = 0$
10. $x = -5$
11. The ladder reaches 10 ft. up the building.
12. $y = -|x + 4|$
13. a. 4
    b. $\frac{1}{5}$
    c. -3
14. x = 7
15. $x = 3 \pm i$
16. $x \in \{8, 12\}$
17. a. (-1, 9)
    b.



18. $(1,2) \cup (2, \infty)$

19. a. hyperbola
    b.



20. a. $V(x) = 12x^3$
    b. The dimensions of the base tier are 6 ft by 6 ft by 2 ft.
    The dimensions of the pedestal tier are 2 ft by 2 ft by 6 ft.