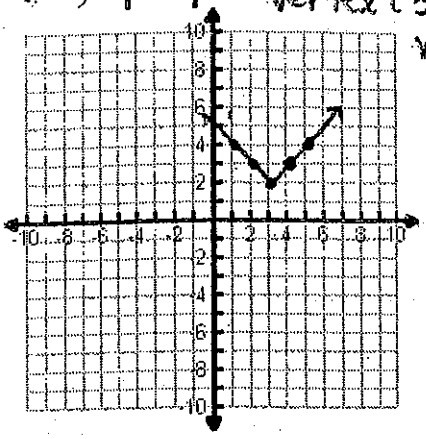
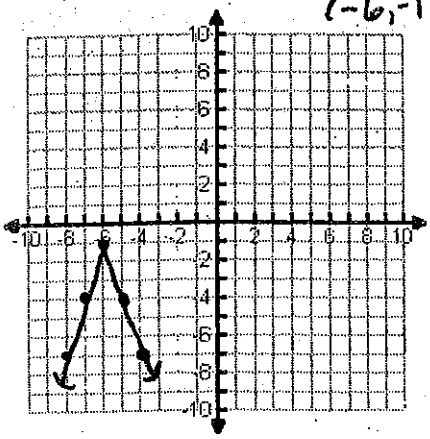
2.1 – 2.4 Review Solutions

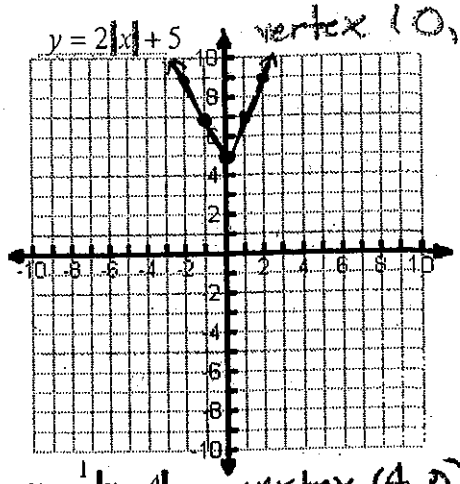
1. $y = |x - 3| + 2$ vertex (3,2)



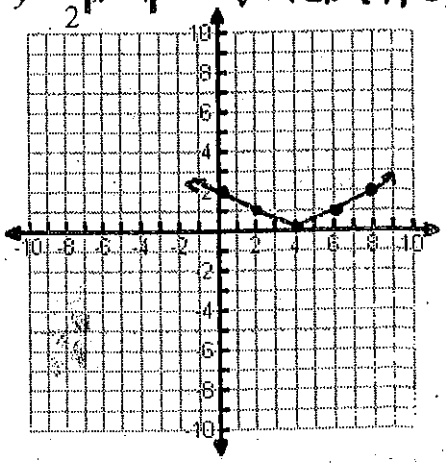
2. $y = -3|x + 6| - 1$ vertex (-6,-1)



2. $y = 2|x| + 5$ vertex (0,5)



4. $y = \frac{1}{2}|x - 4|$ vertex (4,0)



5. $y = |x - 6| + 1$

6. $y = -|x + 1|$

7. $y = 4|x| - 3$

8. shifts down 9 units

9. Shifts left 2 units and up 5 units, vertical reflection, vertical stretch by 3

10. shifts left 6 units, vertical reflection, vertical shrinks by $\frac{2}{3}$

11. $f(x) = \begin{cases} 3x + 7 & if \quad x < -1 \\ -3x + 1 & if \quad x \geq -1 \end{cases}$

12. $f(x) = \begin{cases} -2x + 1 & if \quad x < 3 \\ 2x - 11 & if \quad x \geq 3 \end{cases}$

13. Eq: $y = \frac{1}{3}|x-2| - 5$

Vertex: (2, -5)

Domain: $(-\infty, \infty)$

Range: $[-5, \infty)$

Inc: $(2, \infty)$

Dec: $(-\infty, 2)$

Extrema: min at (2, -5)

14. Eq: $y = -|x-4| - 1$

Vertex: (4, -1)

Domain: $(-\infty, \infty)$

Range: $(-\infty, -1]$

Inc: $(-\infty, 4)$

Dec: $(4, \infty)$

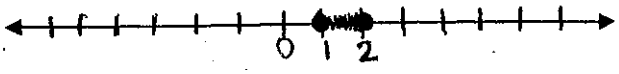
Extrema: max at (4, -1)

15. $x = \frac{1}{5}, x = -1$

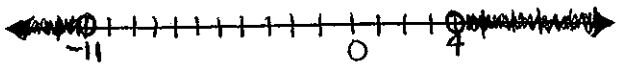
16. $x = -2, x = 3$

17. No Solution

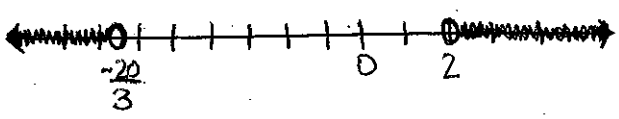
18. $1 \le y \le 2$ $[1,2]$



19. $x > 4 \text{ or } x < -11$ $(-\infty, -11)\ U\ (4, \infty)$



20. $x > 2 \text{ or } x < -\frac{20}{3}$ $\left(-\infty, -\frac{20}{3}\right)\ U\ (2, \infty)$



21. No Solution

22. 320 miles

23. $y = -4x + 5$

24. Domain: $\{-3, -1, 4, 6\}$ Range: $\{1,4,2,3\}$ Function? Yes One-to-one? Yes

25. Domain: $\{-2,1,3,6\}$ Range: $\{-1,4,5\}$ Function? Yes One-to-one? No

25. Domain: $\{-1,2,4\}$ Range: $\{1, -3,2,7\}$ Function? No One-to-one? N/A

27. a) linear b) not linear c) linear d) not linear

28. $g(-6) = 34$

29. $f(-3) = 36$

30. $f(g(2)) = 111$

31. $f(x) = \begin{cases} 2x+9 & if\ x < -7 \\ -2x-19 & if\ x \ge -7 \end{cases}$

32. $f(x) = \begin{cases} -3x+23 & if\ x < 4 \\ 3x-1 & if\ x \ge 4 \end{cases}$

33. $f(x) = \begin{cases} x-10 & if\ x < 2 \\ -x-6 & if\ x \ge 2 \end{cases}$

34. $f(x) = \begin{cases} -4x-33 & if\ x < -9 \\ 4x+39 & if\ x \ge -9 \end{cases}$

35. $y = \frac{1}{2}|x+2| - 3$

36. $y = -2|x-2| + 3$

37. $y = \frac{2}{3}|x-4| - 1$