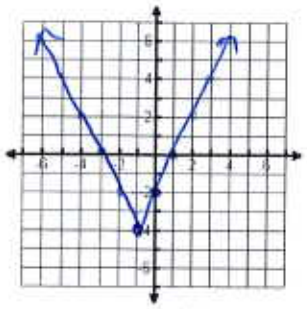
Graph each absolute value function.
Fill in the requested information.

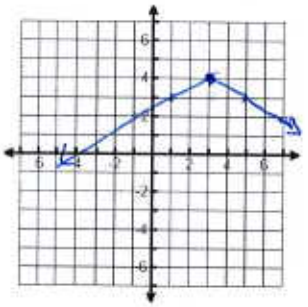
$a=\frac{2}{1}$ $V(-1,-4)$ $a=\frac{-1}{2}$ $V(3,4)$

9. $y=2|x+1|-4$



Dom: $(-\infty,\infty)$ / $\{x \mid -\infty < x < \infty\}$
Range: $[-4,\infty)$ / $\{y \mid -4 \le y < \infty\}$

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



Domain: $(-\infty,\infty)$ / $\{x \mid -\infty < x < \infty\}$
Range: $(-\infty,4]$ / $\{y \mid -\infty < y \le 4\}$

11. $y=-5|x-2|-3$

Absolute value graph shifted 3 units down and 2 units right, with a vertical stretch of 5, reflected horizontally. → flipped so (−)

$a=-5$ $V(2,-3)$ → − ↓

Identify how many solutions each equation has.

12. $|x| = 17$

2 soln

13. $|x| = -2$

no soln.

14. $|x| + 1 = 1$

$-1 \quad -1$

$|x| = 0$

1 soln.

Solve each absolute value function equation algebraically.

15. $|2x-7| - 5 = 4$

$+5 \quad +5$

$|2x-7| = 9$

$2x-7=9$ or $-2x+7=9$

$+7 \quad +7 \qquad -7 \quad -7$

$2x = 16 \qquad -2x = 2$

$x = 8 \qquad x = -1$

16. $|x-3| = 5$

$x-3=5$ or $-x+3=5$

$+3 \quad +3 \qquad -3 \quad -3$

$x = 8 \qquad -x = 2$

$x = -2$

17. $|3x-2| = 0$

$3x-2=0$

$+2 \quad +2$

$\frac{3x}{3} = \frac{2}{3}$

$x = \frac{2}{3}$

18. $|4x-2| = 6$

$4x-2=6$ or $-4x+2=6$

$+2 \quad +2 \qquad -2 \quad -2$

$4x = 8 \qquad -4x = 4$

$x = 2 \qquad x = -1$

Solve the inequality algebraically. Graph on the number line and state the Domain.

19. $\frac{1}{2}|3x+2| + 4 \ge 8$

$-4 \quad -4$

$\frac{2}{1}\cdot\frac{1}{2}|3x+2| \ge 4\cdot\frac{2}{1}$

$|3x+2| \ge 8$

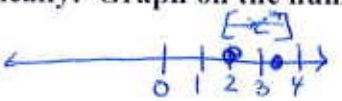
$3x+2 \ge 8$ or $-3x-2 \ge 8$

$-2 \quad -2 \qquad +2 \quad +2$

$3x \ge 6 \qquad -3x \ge 10$

$x \ge 2 \qquad \frac{-3x}{-3} \le \frac{10}{-3}$

$x \le -10/3$



D: $[2, 10/3]$

$\{x \mid 2 \le x \le 10/3\}$

20. $-3|3x-4| - 2 < 4$

$+2 \quad +2$

$\frac{-3|3x-4|}{-3} < \frac{6}{-3}$

$|3x-4| > -2$

no soln.

D: $(-\infty, -\frac{1}{2}] \cup [4,\infty)$

$\{x \mid x \le -\frac{1}{2} \text{ or } x \ge 4\}$

21. $|x-2| - 3 > 5$

$+3 \quad +3$

$|x-2| > 8$

$x-2 > 8$ or $-x+2 > 8$

$+2 \quad +2 \qquad -2 \quad -2$

$x > 10 \qquad \frac{-x}{-1} > \frac{6}{-1}$

$x < -6$

D: $(-\infty,-6) \cup (10,\infty)$

$\{x \mid x < -6 \text{ or } x > 10\}$

22. $8 + |4x-7| \ge 17$

$-8 \quad -8$

$|4x-7| \ge 9$

$4x-7 \ge 9$ or $-4x+7 \ge 9$

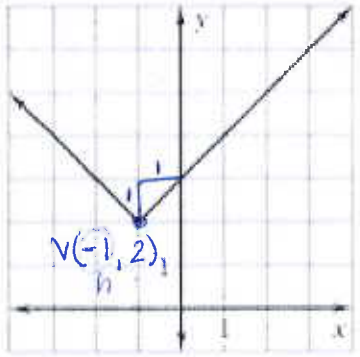
$+7 \quad +7 \qquad -7 \quad -7$

$\frac{4x}{4} \ge \frac{16}{4} \qquad \frac{-4x}{-4} \ge \frac{2}{-4}$

$x \ge 4 \qquad x \le -\frac{1}{2}$

Math 2 – Absolute Value REVIEW Name: Key Per:

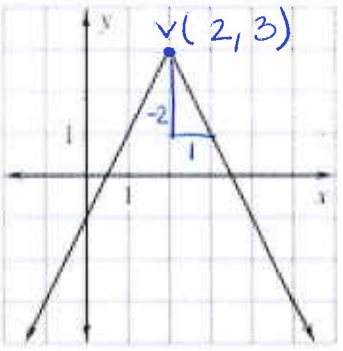
Find the equation for the graphs shown below. Write the equation as an absolute-value function and the domain and range of each function.

1. 

f(x) = $|x+1|+2$

Domain: $(-\infty,\infty)$ $\{x \mid -\infty < x < \infty\}$

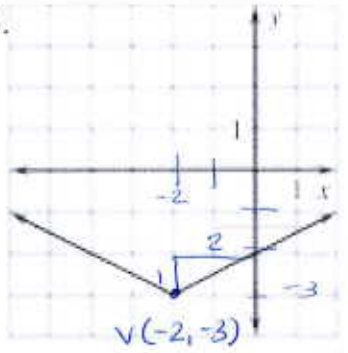
Range: $[2,\infty)$ $\{y \mid 2 \le y \le \infty\}$

2. 

f(x) = $-2|x-2|+3$

Domain: $(-\infty,\infty)$ $\{x \mid -\infty < x < \infty\}$

Range: $(-\infty,3]$ $\{y \mid -\infty < y \le 3\}$

3. 

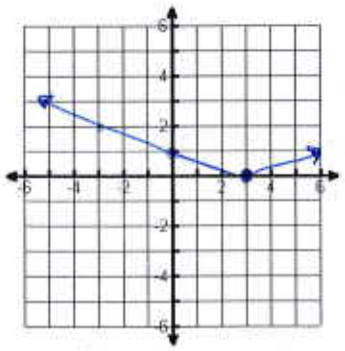
f(x) = $\frac{1}{2}|x+2|-3$

Domain: $(-\infty,\infty)$ $\{x \mid -\infty < x < \infty\}$

Range: $[-3,\infty)$ $\{y \mid -3 \le y < \infty\}$

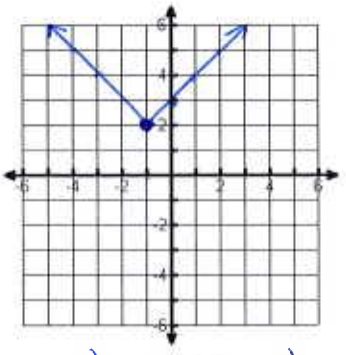
Graph each function below. State the domain and range..

4. $y = \frac{1}{3}|x-3|$ $a=\frac{1}{3}$, V(3,0)



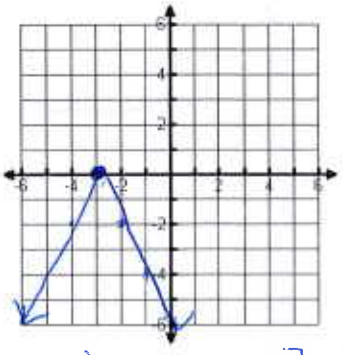
D: $(-\infty,\infty)$ $\{x \mid -\infty < x < \infty\}$ R: $[0,\infty)$ $\{y \mid 0 \le y < \infty\}$

5. $f(x) = |x+1|+2$ $a=\frac{1}{1}$, V(-1,2)



D: $(-\infty,\infty)$ $\{x \mid -\infty < x < \infty\}$ R: $[2,\infty)$ $\{y \mid 2 \le y < \infty\}$

6. $f(x) = -2|x+3|$ $a=\frac{-2}{1}$, V(-3,0)



D: $(-\infty,\infty)$ $\{x \mid -\infty < x < \infty\}$ R: $(-\infty,0]$ $\{y \mid -\infty < y \le 0\}$

* Solve the following absolute values graphically.

7. $|x+2|-5=2$

$a=\frac{1}{1}$ V(-2,-5)

y = 2

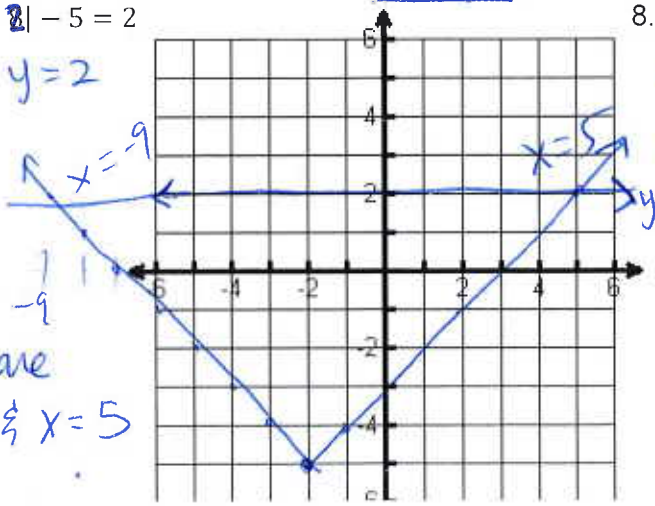
x = -9

x = 5

y = 2

-9

Soln. are x = -9 & x = 5



8. $-3|x-3|+1=-1$

$a=\frac{-3}{1}$, y = -1

V(3,1)

the soln is about x = 2.2 & x = 3.7