

Name: _____

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Absolute Value Test Review..... use separate sheet of paper to show ALL work / review is due on day of test!!

#1-4: For each transformation, describe the effect on the graph of the basic absolute value function $f(x) = |x|$.

1. $a(x) = |43x|$ Horizontal Compression by $\frac{1}{3}$

3. $b(x) = -|x+2|$ Left 2, reflected over x-axis

2. $k(x) = 2|x| - 3$
Down 3
Vertical Stretch 2

4. $p(x) = -3|x| - \frac{1}{3}$
Down $\frac{1}{3}$, vertical stretch of 3
Reflected over x-axis

#5-6: Write a transformed absolute value function in terms of the basic absolute value function $f(x) = |x|$ for the given characteristics. Then, graph the transformed function.

5. Vertex $(0, -2)$ and range $[-2, \infty)$ $f(x) = |x| - 2$

6. Vertex $(1, -2)$, vertically compressed by a factor of $\frac{1}{2}$ and range $(-\infty, -2]$

#7-10: Solve each linear absolute value equation.

7. $|x+9| = 2$

$$\begin{array}{l} x+9=2 \\ x=-7 \end{array} \quad \begin{array}{l} x+9=-2 \\ x=-11 \end{array}$$

8. $|5x+1| = 14$

$$\begin{array}{l} 5x+1=14 \\ 5x=13 \\ x=\frac{13}{5} \end{array} \quad \begin{array}{l} 5x+1=-14 \\ 5x=-15 \\ x=-3 \end{array}$$

9. $|x+3| - 7 = 40$

$$\begin{array}{l} x+3=47 \\ x=44 \end{array}$$

$$\begin{array}{l} x+3=-47 \\ x=-50 \end{array}$$

10. $2|x| - 5 = 11$

$$\begin{array}{l} 2|x|=16 \\ |x|=8 \\ x=8 \quad x=-8 \end{array}$$

#11-14: Solve each linear absolute value inequality. Graph the solution on a number line.

11. $|x+5| < 2$

$$\begin{array}{l} x+5 < 2 \\ x < -3 \end{array} \quad \begin{array}{l} x+5 > -2 \\ x > -7 \end{array}$$

12. $3|x+4| \geq 9$

$$\begin{array}{l} x+4 \geq 3 \\ x \geq -1 \end{array}$$

$$\begin{array}{l} x+4 \leq -3 \\ x \leq -7 \end{array}$$

No Solutions

13. $2|x-1| - 8 \leq 10$

$$\begin{array}{l} x-1 \leq 9 \\ x \leq 10 \end{array}$$

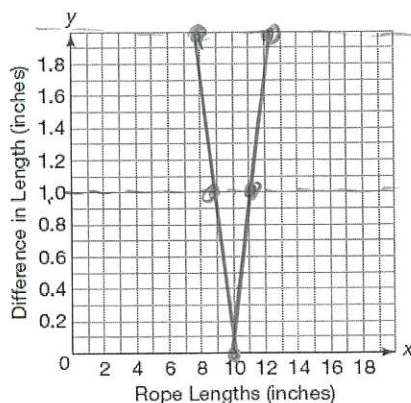
$$\begin{array}{l} x-1 \geq -9 \\ x \geq -8 \end{array}$$

14. $3|x+2| + 5 \geq 23$

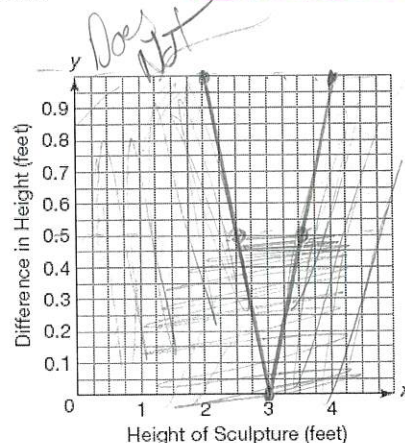
$$\begin{array}{l} |x+2| \geq 6 \\ x+2 \leq -6 \\ x \leq -8 \end{array} \quad \begin{array}{l} x+2 \geq 6 \\ x \geq 4 \end{array}$$

#15-16: Graph the function that represents each problem situation. Draw an oval on the graph to represent the answer.

15. Julian is cutting lengths of rope for a class project. Each rope length should be 10 inches long. The specifications allow for a difference of 1 inch. The function
- $f(x) = |x - 10|$
- represents the difference between the rope lengths cut and the specifications. Graph the function. What rope lengths meet the specifications?



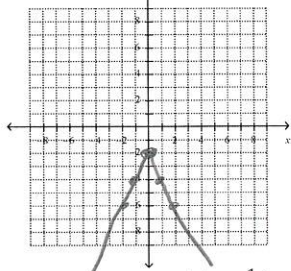
16. The rules of an art contest state that sculptures submitted should be 3 feet high but allow for a difference of 6 inches. The function
- $f(x) = |x - 3|$
- represents the difference between a sculpture that is submitted and the specifications. Graph the function. What heights do not meet the specifications?



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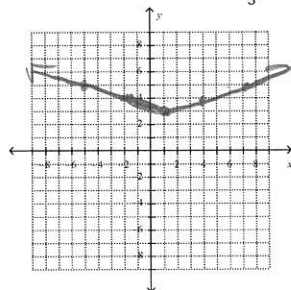
17. Graph the transformation $g(x) = -2|x| - 2$. State the domain and range.



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

$$R: (-\infty, -2]$$

18. Graph the transformation $f(x) = \frac{1}{3}|x - 1| + 3$. State the domain and range.



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

$$R: [3, \infty)$$

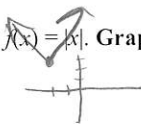
19. The basic absolute value function $f(x) = |x|$ is translated down 5 units and vertically compressed by a factor of $\frac{1}{3}$ to form $n(x)$. Write an equation for $n(x)$ in terms of $f(x)$.

$$n(x) = \frac{1}{3}|x| - 5$$

20. The basic absolute value function $f(x) = |x|$ is translated to form $p(x)$, where $p(x)$ has a vertex of $(-1, 2)$ and a range of $[2, \infty)$. Write an equation for $p(x)$ in terms of $f(x)$ and graph $p(x)$.

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

21. Consider the basic absolute value function $f(x) = |x|$. Graph the transformation $g(x) = f(x + 2) + 3$. Identify the vertex and state the domain and range of $g(x)$.



$$(-2, 3)$$

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

$$R: [3, \infty)$$

Review of Lines and Matrices – this will be on Test #2 and ALL students must complete this portion of the test.

22. Write in standard form an equation of the line passing through the given point with the given slope.

slope = -7; (4, -13)

$$-7(x - 4) = y + 13$$

$$-7x + 28 = y + 13 - 13$$

$$-7x - 13 = y$$

$$15 = 7x + y$$

$$7x + y = 15$$

23. Find an equation for the line: a. through (2, 4) and parallel to $y = 5x + 4$.

$$y - 4 = 5(x - 2)$$

- b. through $(-2, -3)$ and perpendicular to $y = -\frac{4}{7}x - 32$

$$y + 3 = \frac{7}{4}(x + 2)$$

24. Solve the following system by graphing:

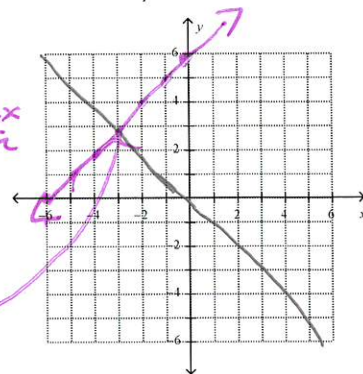
$$\begin{cases} -x - y = 0 + y \\ 2x - 2y = -12 - 2x \end{cases}$$

$$\begin{cases} -x - y = 0 + y \\ 2x - 2y = -12 - 2x \end{cases}$$

$$y = -x$$

$$y = x + 6$$

$$(-3, 3)$$

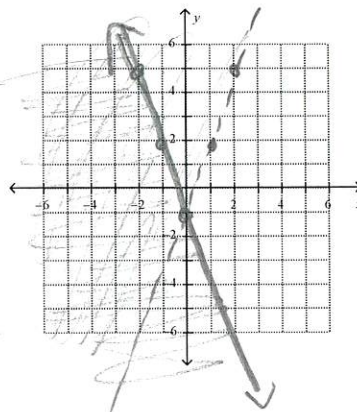


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25. Use the graph to show the solution:

$$\begin{cases} y \leq -3x - 1 \\ y > 3x - 1 \end{cases}$$



26. Solve the System:

$$\begin{aligned} 4x + 9 &= 5 \\ -9 & \quad -9 \\ \hline 4x &= 4 \end{aligned}$$

$$x = 1$$

$$\begin{aligned} 4x - 3y &= 5 \\ 4x + 5y &= -11 \\ \hline \end{aligned}$$

$$\frac{2y}{2} = \frac{-6}{2}$$

$$y = -3$$

$$(1, -3)$$

27. Solve the System:

$$\begin{aligned} 20x + 10y &= -60 \\ 10x - 10y &= 30 \\ \hline \end{aligned}$$

$$30x = -30$$

$$x = -1$$

$$\begin{aligned} 4x + 2y &= -12 \\ 5x - 5y &= 15 \\ \hline \end{aligned}$$

$$\begin{aligned} -4 + 2y &= -12 \\ +4 & \quad +4 \\ \hline 2y &= -8 \end{aligned}$$

$$2y = -8$$

$$y = -4$$

$$(-1, -4)$$

28. Solve the system:

$$\begin{cases} -x - 3y - 2z = 5 \\ x + 3y + 3z = -5 \\ 2x + y + z = -5 \end{cases}$$

$$(-2, -1, 0)$$

29. Solve the system:

$$\begin{cases} 3x + 5y + 4z = 13 \\ 5x + 2y + 3z = -9 \\ 6x + 3y + 4z = -8 \end{cases}$$

$$(-3, 6, -2)$$

30. What are the dimensions of Matrix B, Matrix A and Matrix C?

$$A = \begin{bmatrix} -5 & 4 \\ -8 & 2 \end{bmatrix} \quad B = \begin{bmatrix} -2 & 7 & -3 \\ 1 & -6 & 0 \end{bmatrix} \quad C = \begin{bmatrix} 5 & 3 & -1 \\ -3 & 0 & 6 \end{bmatrix}$$

$2 \times 2 \qquad \qquad 2 \times 3 \qquad \qquad 2 \times 3$