

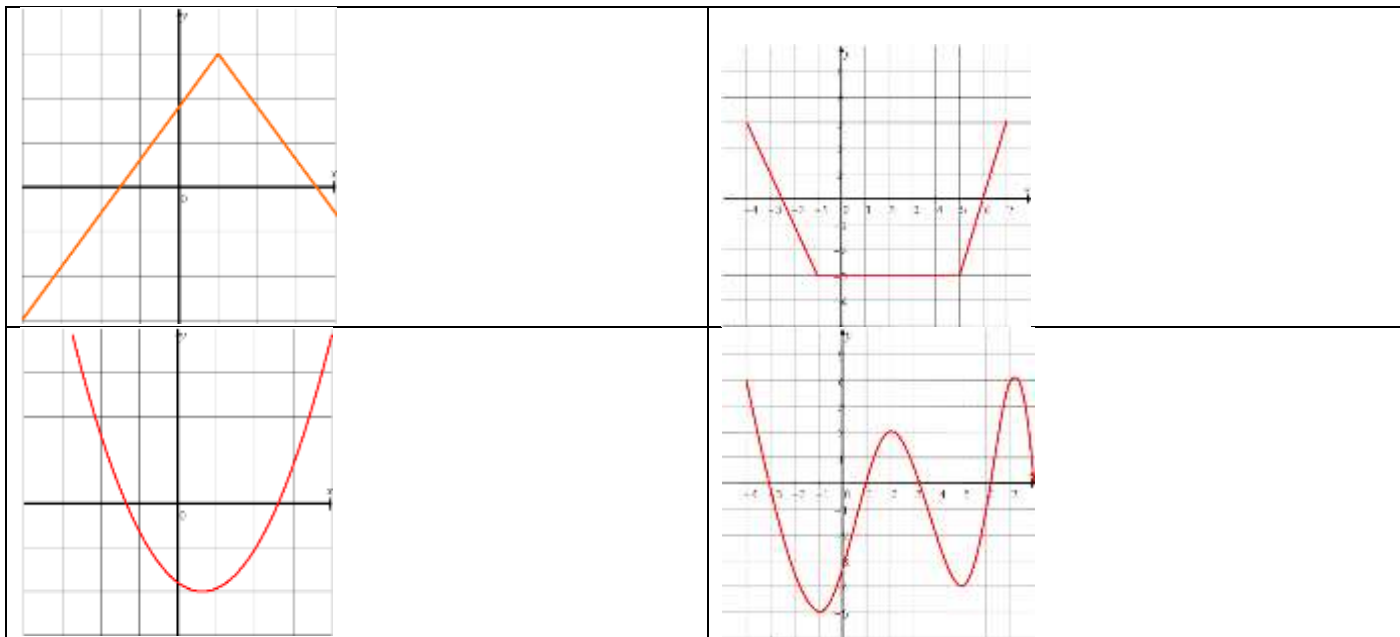
Name: _____

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Pre Calculus 11: HW Section 5.2 Graphing Absolute Value Equations: SOLUTIONS

1. Given each graph of $y = f(x)$, draw the graph of $y = |f(x)|$

In general, flip anything that is under the "x" axis to above it.

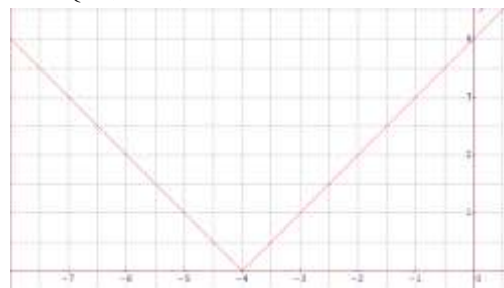


2. Graph each absolute value function. Find the x-intercept and then state the piece wise function:

a) $y = |x + 4|$

"x" intercept at $(-4, 0)$

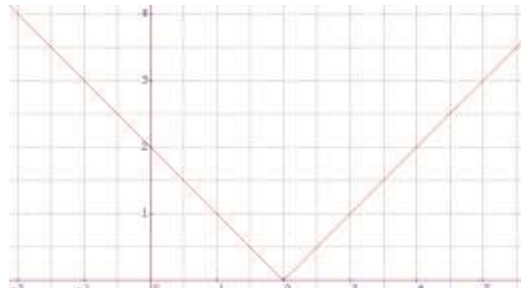
$$y = \begin{cases} x + 4 & ; x > -4 (R) \\ -(x + 4) & ; x \leq -4 (L) \end{cases}$$



b) $y = |x - 2|$

"x" intercept $(2, 0)$

$$y = \begin{cases} x - 2 & ; x > 2 \\ -(x - 2) & ; x \leq 2 \end{cases}$$

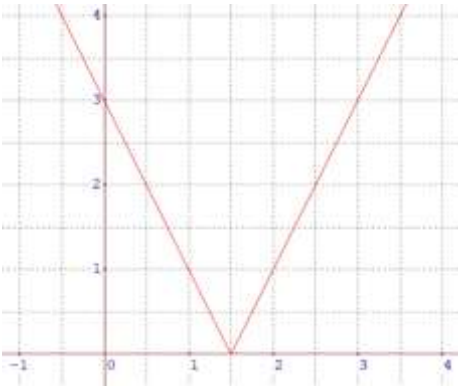
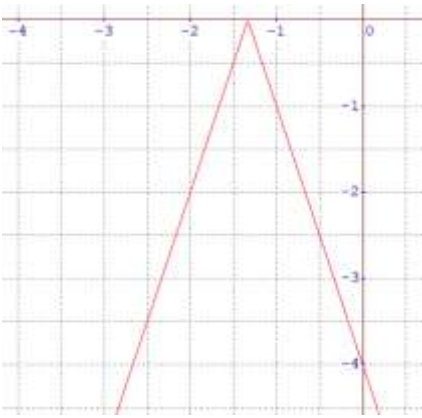
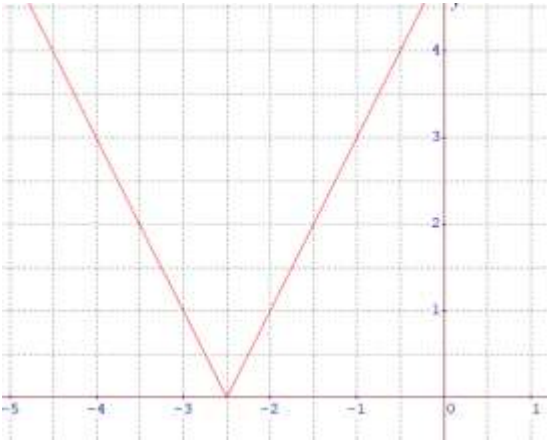
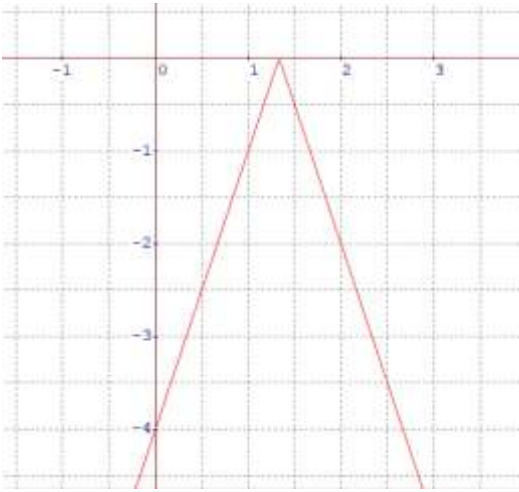


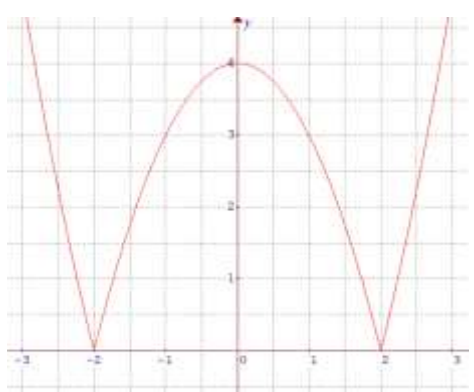
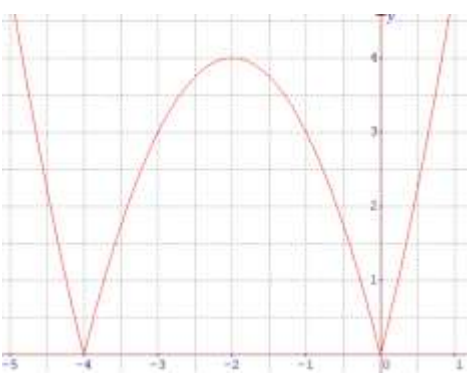
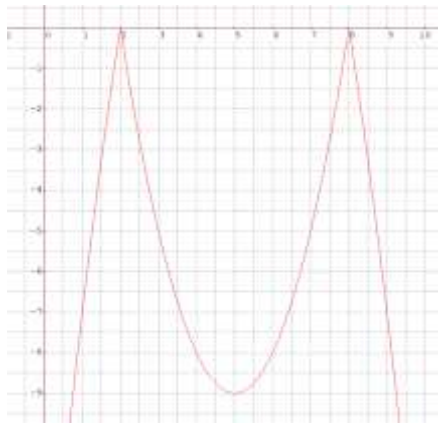
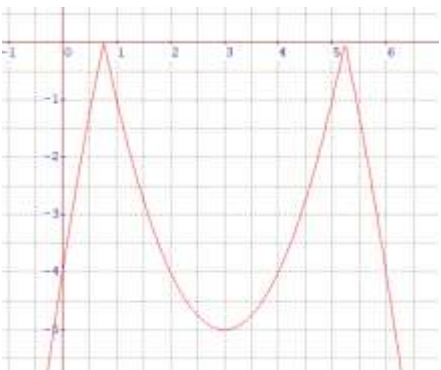
a) $y = |2x - 3|$

"x" intercept $(3/2, 0)$

b) $y = -|3x + 4|$

"x" intercept $(-4/3, 0)$

$y = \begin{cases} 2x-3 & ; x > \frac{3}{2} (R) \\ -(2x-3); & x \leq \frac{3}{2} (L) \end{cases}$ 	$y = \begin{cases} -(3x+4) & ; x > \frac{3}{2} (R) \\ 3x+4 & ; x \leq \frac{3}{2} (L) \end{cases}$ 
a) $y = -2x - 5 $	b) $y = - 4 - 3x $
"x" intercept: (-5/2, 0) $y = \begin{cases} -(-2x-5) & ; x > -\frac{5}{2} (R) \\ -2x-5; & x \leq -\frac{5}{2} (L) \end{cases}$ 	"x" intercept (4/3, 0) $y = \begin{cases} 4-3x & ; x > \frac{4}{3} (R) \\ -(4-3x); & x \leq \frac{4}{3} (L) \end{cases}$ 
a) $y = x^2 - 4 $	b) $y = (x+2)^2 - 4 $
"x" intercepts (2,0) and (-2,0) $y = \begin{cases} x^2-4 & ; x < -2 (L) \\ -(x^2-4) & ; -2 \leq x < 2 (M) \\ x^2-4 & ; 2 \leq x (R) \end{cases}$	"x" intercepts (0,0) and (-4,0) $y = \begin{cases} (x+2)^2-4 & ; x < -4 (L) \\ -(x+2)^2+4 & ; -4 \leq x < 0 (M) \\ (x+2)^2-4 & ; 0 \leq x (R) \end{cases}$

	
a) $y = - (x-5)^2 - 9$	b) $y = x^2 - 6x + 4$
"x" intercepts (2,0) and (8,0) $y = \begin{cases} -(x-5)^2 + 9 & ; x < 2 \text{ (L)} \\ (x-5)^2 - 9 & ; 2 \leq x < 8 \text{ (M)} \\ -(x-5)^2 + 9 & ; 8 \leq x \text{ (R)} \end{cases}$ 	"x" intercepts $x = 3 \pm \sqrt{5}$ $y = \begin{cases} -(x^2 - 6x + 4) & ; x < 3 - \sqrt{5} \text{ (L)} \\ x^2 - 6x + 4 & ; 3 - \sqrt{5} \leq x < 3 + \sqrt{5} \text{ (M)} \\ -(x^2 - 6x + 4) & ; 3 + \sqrt{5} \leq x \text{ (R)} \end{cases}$ 

3. What is the difference between the graphs of $y = |3x+1|$ and $y = -|3x+1|$.

$y = |3x+1|$ this is a V shaped graph that opens up

$y = -|3x+1|$ this is V shaped graph that opens down

4. What is the difference between the graphs of $y = |3x+1|$ and $y = |3x+1| + 4$.

$y = |3x+1|$ this graph opens up and has the vertex on the x-axis

$y = |3x+1| + 4$ this graph also opens up, but is shifted up 4 units from the x-axis.

5. The following points $(3,5)$, $(-3,-7)$, $(-2,8)$, $(7,-10)$, and $(-3,-9)$ are on the function $y = f(x)$.

What will the coordinates be on the function: $y = |f(x)|$?

Only the points with a negative y-coordinate are reflected. The new points on $y = |f(x)|$ are

$(3,5)$, $(-3,7)$, $(-2,8)$, $(7,10)$, and $(-3,9)$

6. Given each equation on the right, indicate which of the graphs on the right is the corresponding one:

a) $y = - -3x + 7 $ II)	b) $y = (x+3)^2 - 4 $ IV	i)	ii)	iii)
c) $y = -(x-3)^2 - 5$ VI	d) $y = 3x + 7 $ i)	iv)	v)	vi)
e) $y = (x+3)^2 + 1 $ iii)	f) $y = - -5x - 8 + 4$ v			

7. Solve each of the following equations:

i)	ii) $ x^3 - 2x^2 + 4x + 1 + 12 = 3$ $ x^3 - 2x^2 + 4x + 1 = -9$ NO SOLUTION!!
iii) $2 3x - 4 + 7 = 10$ $2 3x - 4 = 3$ $ 3x - 4 = 1.5$ $3x - 4 = 1.5 \quad 3x - 4 = -1.5$ $3x = 5.5 \quad 3x = 2.5$ $x = \frac{11}{6} \quad x = \frac{5}{6}$ Both solutions work!!	iv) $ 4x + 1 - 1 = -3x + 4$ $ 4x + 1 = -3x + 5$ $4x + 1 = -3x + 5 \quad 4x + 1 = 3x - 5$ $7x = 4 \quad x = -6$ $x = \frac{4}{7}$ Both solutions work!!

v) $3 9+2x -14=18$ $9+2x = \frac{32}{3}$ $9+2x = \frac{32}{3} \qquad 9+2x = -\frac{32}{3}$ $2x = \frac{5}{3} \qquad 2x = \frac{59}{3}$ $x = \frac{5}{6} \qquad x = \frac{59}{6}$	vi) $5-3x +12=31$ $5-3x =19$ $5-3x=19 \qquad 5-3x=-19$ $-3x=14 \qquad -3x=-24$ $x = \frac{-14}{3} \qquad x=8$
vii) $x^2+9 =6x$ $x^2+9=6x \qquad x^2+9=-6x$ $x^2-6x+9=0 \qquad x^2+6x+9=0$ $(x-3)^2=0 \qquad (x+3)^2=0$ $x=3 \qquad x \neq -3 \text{ (extraneous root!!)}$	viii) $2x^2-x-6 =2x+1$