Name:_____ Date:_____

Math 10 Enriched Section 5.4a: Review: Absolute Value Expressions and Equations

1. Evaluate each of the following:

a) $\lvert -22 \rvert$	b) $\lvert 17-28 \rvert$	c) $\lvert -(-3\times 20) \rvert$
d) $\lvert -(23-44) \rvert$	e) $-\lvert -(-41+12) \rvert$	f) $-\lvert 7-\lvert 3-18 \rvert \rvert$
g) $\lvert (30-35)+(18-26) \rvert$	h) $\lvert 14-21 \rvert - 9\lvert 5-11 \rvert$	i) $-\lvert -5(5-11) \rvert$
j) $\frac{\lvert -24 \rvert}{-\lvert -4 \rvert}$	k) $3\lvert 11-3\lvert -6 \rvert \rvert$	L) $-(23-18)^2 - \lvert -4-8 \rvert^3$
m) $\frac{\lvert -24 \rvert}{\lvert -34 \rvert - \lvert -4 \rvert}$	n) $\frac{\lvert -8 \rvert + \lvert -5 \rvert}{\lvert -8 \rvert - \lvert -5 \rvert}$	o) $\frac{\lvert 12 \rvert + \lvert -8 \rvert}{\lvert -14 \rvert - \lvert -4 \rvert}$
p) $\sqrt{(-15)^2}$	q) $\sqrt{223^2}$	r) $\sqrt{(-2a^3b)^2}$

2. Arrange each of the following from least to greatest:

I) $\lvert -12 \rvert$ II) $-\lvert -3\times 4 \rvert$ III) $\lvert -8-3 \rvert$ IV) $2\lvert 2-7 \rvert$ V) $-\lvert 8-2 \rvert^2$

3. If $a = b-1$, then what is the value of $\lvert a-b \rvert + \lvert b-a \rvert$?

4. If $\sqrt{a^2} = 13$, then what is the value of "a"?

5. Given the statements below, which of them can not be correct? Explain why:

a. $\lvert a+b \rvert = -5$ b) $-\lvert 2a \rvert = 6$

c. $\sqrt{(2a)^2} = \lvert 2a \rvert$ d) $\lvert a-b \rvert = \lvert b-a \rvert$

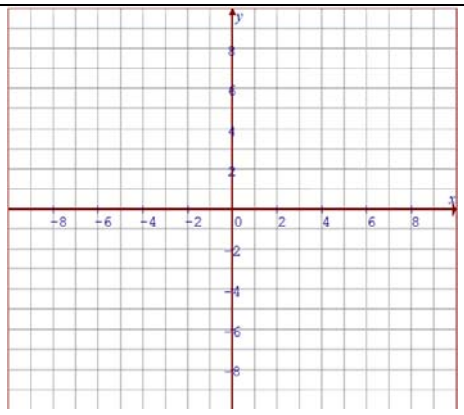
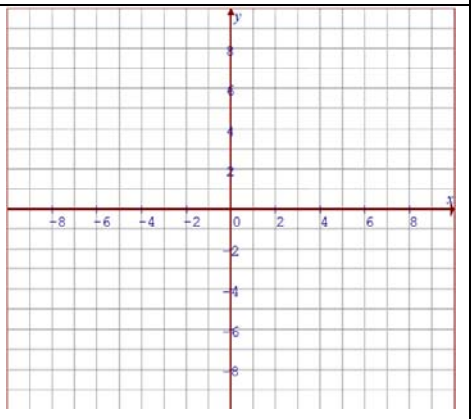
6. The shortest distance between any point P(m,n) and a line with equation $Ax+By+C=0$ is given by the formula: $D=\dfrac{|Am+Bn+C|}{\sqrt{A^2+B^2}}$. Suppose you have a line $-3x+4y-8=0$ and a point P(1,5), what is the shortest distance from the point to the line?

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

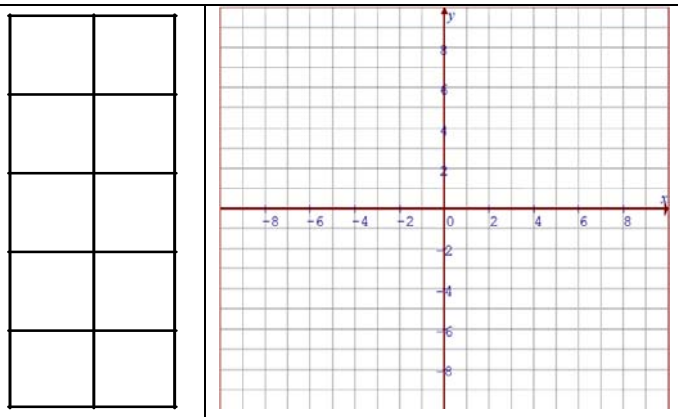
8. What is the difference between the graphs of $y=|3x+1|$ and $y=|3x+1|+4$.

9. 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: $y=|f(x)|$?

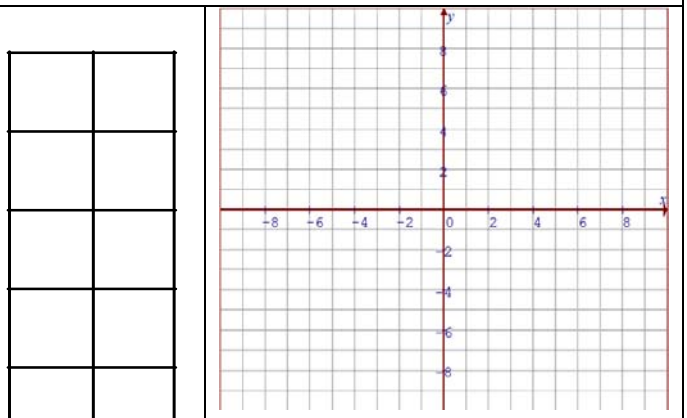
10. Given each equation, make a TOV, graph it on the grid provided, and state the piece wise function:

a) $y=\|2x-3\|$		b) $y=-\|3x+4\|$	
			

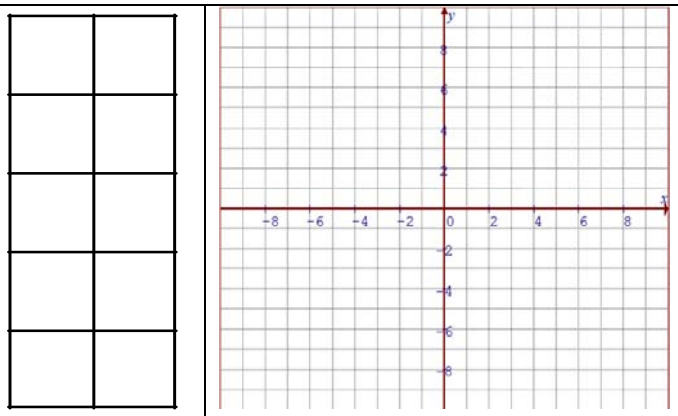
c) $y = |-2x - 5|$



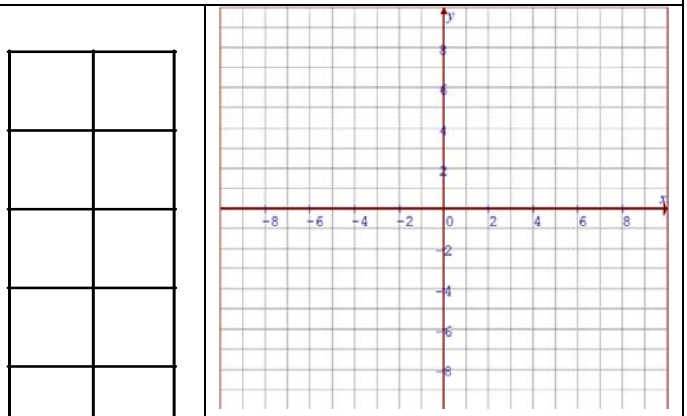
d) $y = -|2 - 3x|$



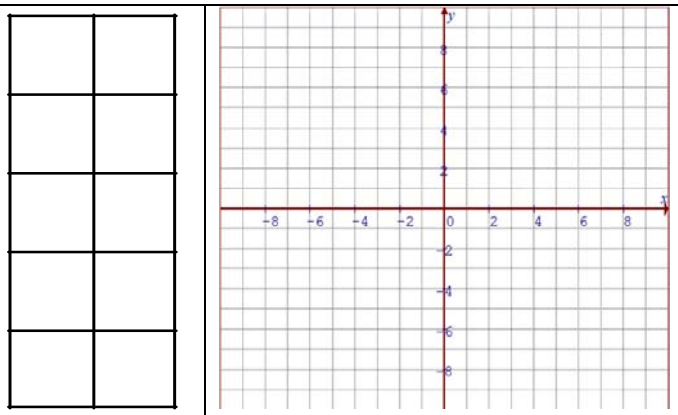
a) $y = |x^2 - 4|$



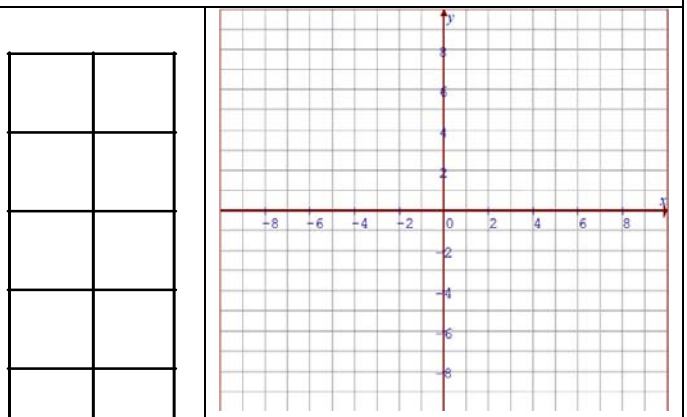
b) $y = |(x+2)^2 - 4|$



a) $y = -|(x-5)^2 - 9|$

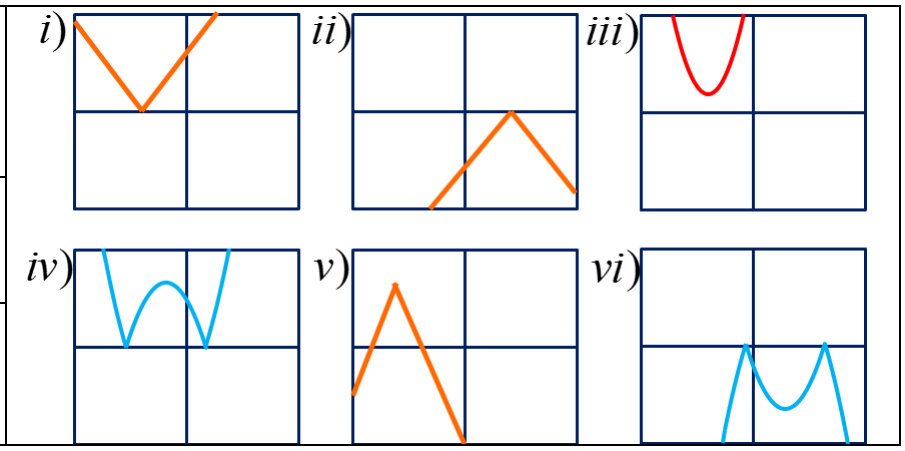


b) $y = |x^2 - 6x + 4|$



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

a) $y=-\lvert-3x+7\rvert$	b) $y=\lvert(x+3)^2-4\rvert$	
c) $y=-\lvert(x-3)^2-5\rvert$	d) $y=\lvert3x+7\rvert$	
e) $y=\lvert(x+3)^2+1\rvert$	f) $y=-\lvert-5x-8\rvert+4$	



12. Given each equation, indicate the coordinates of the vertex:

a) $y=\lvert2x\rvert$	b) $y=\lvert2x-3\rvert$	c) $y=\lvert2x+5\rvert$
d) $y=\lvert-3x\rvert$	e) $y=\lvert-3x+7\rvert$	f) $y=\lvert-3x-8\rvert$
g) $y=\lvert6x\rvert$	h) $y=\lvert6x\rvert+4$	i) $y=\lvert6x\rvert-3$

13. Solve each of the following. Show all your work and steps:

a) $\lvert x+3\rvert=11$	b) $\lvert x-7\rvert=12$
c) $\lvert x\rvert+\lvert x-1\rvert=4$	d) $\lvert1-x\rvert+\lvert2x\rvert=17$

e) $\lvert 2x-5\rvert+8=\lvert 3x\rvert$	f) $\lvert x-3\rvert+\lvert 2x-1\rvert-3=1$
g) $\lvert 5-3x\rvert=\lvert 2x+9\rvert$	h) $-\lvert 2x-4\rvert+18=\lvert x-8\rvert$
i) $\lvert x^2+9\rvert=6x$	j) $\lvert 2x^2-x-6\rvert=2x+1$
k) $12=\lvert x^2+3\rvert$	l) $\lvert x^2-10x\rvert=24$
m) $\lvert 13x-x^2\rvert=30$	n) $\lvert x^2-3x\rvert=4$

14. Solve for "x" : $|x+4| = |-12|$

15. Find all the value(s) of "x" for which the equation is true: $|x| = |x+1|$

16. Find the two value(s) that will satisfy the equation: $|x-1| + |x| + |x+1| = \frac{5}{2}$

17. Solve for "x" $|x^2 - 9x + 20| = |16 - x^2|$

18. How many ordered pairs of integers (a,b) satisfy this equation? $|a-2| \times |b-3| = 2$

19. How many integer solutions are there? $3 \le |2n-1| \le 100$