

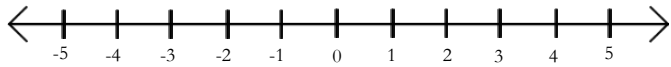
2.0 Absolute value_1.notebook

May 03, 2016

OUTCOME:

AN1 - Demonstrate an understanding of absolute value of real numbers

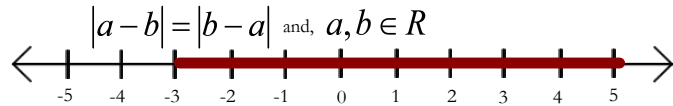
Absolute value: $|x|$



-5 and 5 are both 5 units from 0

$\therefore |-5| =$ and $|5| =$

The distance between two points on a number line, a and b can be found by taking the absolute value of the difference between a and b , where

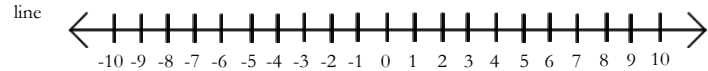


** Absolute value signs are considered as brackets for order of operations. **

1. Evaluate:

a. $|-7|$ b. $|9|$ c. $|-2 - 8|$ d. $|5 - -6|$

2. Draw the above absolute values on a number

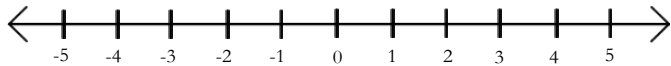


3. What does $|-7|$ represent?

4. What is the magnitude of -10?

5. Place the following numbers on a number

line A (0.7) B (-1.4) C $(-\frac{3}{5})$ D $(-2\frac{1}{4})$ E (2)



i) determine the absolute value of each number

ii) determine the distance between B and E, and between C and D

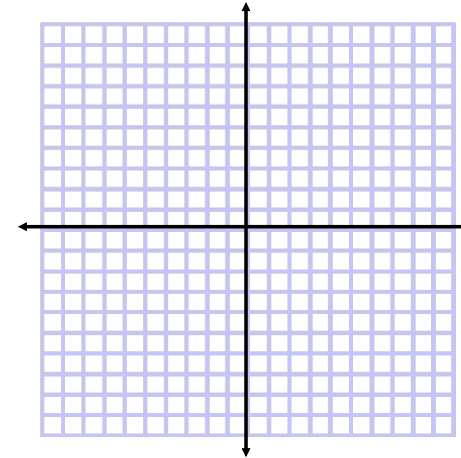
6. Determine the value of: $7|0.4 - 5| + |(-2)^3|$

Practice: Page 363 #1,3,4,5, 6ACE

Outcome: RF2 - Graph and analyze absolute value functions (linear and quadratic) to solve problems.

$y = x$

x	y
-2	
-1	
0	
1	
2	



$y = |x|$

x	y
-2	
-1	
0	
1	
2	

$y = |x|$ is defined as a **piecewise** function (composed of two or more separate functions)

For all values of $f(x)$ less than 0, the y-values of $|f(x)|$ is $-f(x)$;

and for all values of $f(x)$ greater than 0 or equal to 0, the y-value of $|f(x)|$ is $f(x)$

The following table of values is given for $y = f(x)$

Fill in the corresponding values for $y = |f(x)|$

Function notation reminder:

$y = 2x - 3$

$f(x) = 2x - 3$

$f(5) = 2(5) - 3$

x	f(x)	f(x)
-3	32	
-2	12	
-1	-2	
0	-10	
1	-12	
2	8	
3	2	

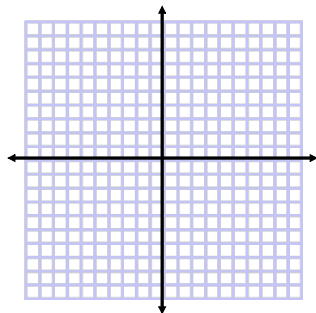
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For the function $f(x) = 2x - 1$
 Make a table of values for $f(x)$ and $|f(x)|$

x	f(x)	f(x)

Write the piecewise function for $f(x)$.
 You need to find the x-intercept...



Write $y = |-3x + 7|$ as a piecewise function

Write the following as piecewise functions.

a) $y = |2x + 4|$

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

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

When graphing, graph the line of $y = f(x)$

The x-intercept of this line is the same as the x-intercept of the absolute value function because the value of zero is still zero. This is called an invariant point.

(A point that remains unchanged when a transformation is applied to it.)

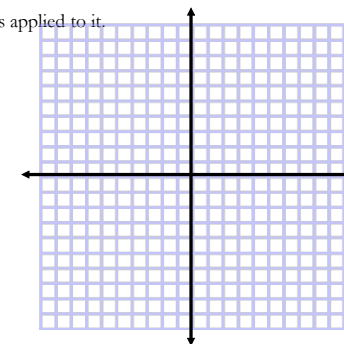
x-intercept:

y-intercept:

domain:

range:

piecewise function:

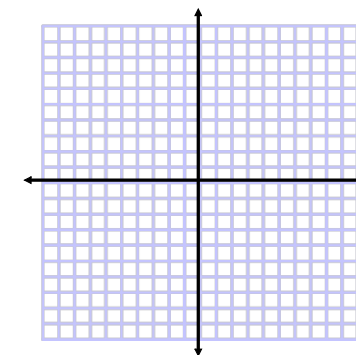


You try: $y = |2x - 4|$

Determine the x-intercept and y-intercepts:

Sketch the graph:
 State the domain and range:

Express as a piecewise function:

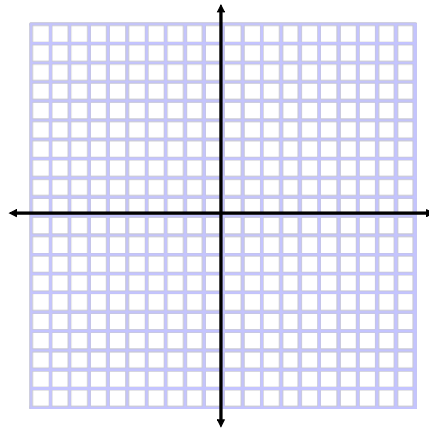


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$$y = |3x + 1|$$

Determine the x-intercept and y-intercepts:



Sketch the graph:

State the domain and range:

Express as a piecewise function:

Practice: p375 # 1, 2, 5, 6ace, 9,11ab

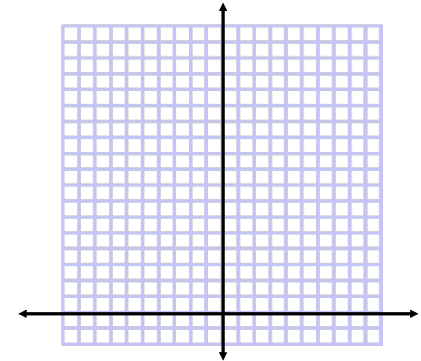
Absolute value and quadratic functions:

$$\text{Graph: } y = |x^2 + 4x - 12|$$

Find x-int's (y=0)...factor

Find y-int (x=0)

Find vertex (complete the square...or...average x-int's)



Absolute value and quadratic functions:

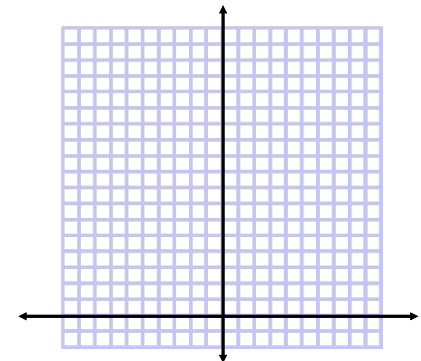
Graph:

$$y = |x^2 + 8x + 15|$$

Find x-int's (y=0)...factor

Find y-int (x=0)

Find vertex (complete the square...or...average x-int's)



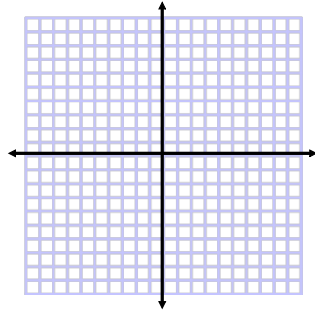
Page 376-7 #7, 8abe, 10

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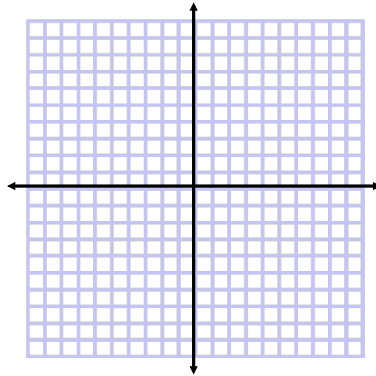
Solving inequalities graphically.

Solve: $|x - 4| = 6$



Solve for x: $|3x - 6| = 12$

Solve: $|2x - 2| = 6$



Explain why $|2x + 3| = -1$ cannot exist. (has no solution)

When solving questions involving absolute value, both parts of the piecewise function must be examined individually.

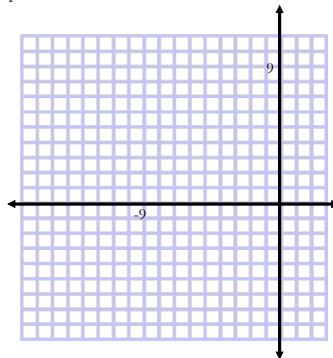
Solve for x: $|x + 9| = 7$

x-intercept:

So: $|x + 9| = \begin{cases} x + 9, & \text{for } x \geq -9 \\ -(x + 9), & \text{for } x < -9 \end{cases}$

Case 1:

Case 2:



Practice: page 389 #2bc, 4abc

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Absolute Value equations with extraneous solutions.

$$\text{Solve: } |2x - 5| = 5 - 3x$$

Solve:

$$|x + 5| = 4x - 1$$

You MUST VERIFY ANY EQUATIONS OF THIS TYPE!!!!

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