Homework p.11

2. State the domain and range of each relation. Then determine whether the relation is a function, and justify your answer.

a) $y = -2(x + 1)^2 - 3$

b) $y = \dfrac{1}{x + 3}$

c) $y = 2^{-x}$

d) $y = \cos x + 1$

e) $x^2 + y^2 = 9$

f) $y = 2 \sin x$

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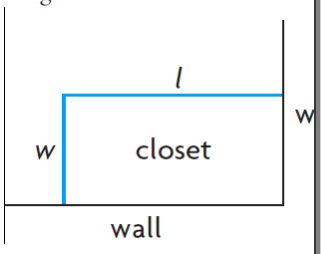
6. Martin wants to build an additional closet in a corner of his bedroom. Because the closet will be in a corner, only two new walls need to be built. The total length of the two new walls must be 12 m. Martin wants the length of the closet to be twice as long as the width, as shown in the diagram.

a) Explain why $l = 2w$.

b) Let the function $f(l)$ be the sum of the length and the width. Find the equation for $f(l)$.

c) Graph $y = f(l)$.

d) Find the desired length and width.



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Sec 1.2 Absolute Values

In some cases, the value of number is simply its distance from a single point.

ie. The distance a golf ball is from the hole on a golf green. The direction from the hole doesn't matter.

Direction can be expressed in many ways, one of which is the use of a negative sign. An absolute value describes the MAGNITUDE of the number only.

ie. The temperature changed from 10 degrees to -30 degrees. We would say the temperature dropped 40 degrees (-40), but the absolute value of the change in temperature is only "40" degrees.

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Absolute Values are expressed using the following notation:

$$|50| = 50$$

- two parallel lines around the number, not brackets

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On a number line, the distance from zero is the magnitude of the line. We call it absolute value.

$|8| = 8$

$|-6| = 6$ Please note the change here.

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Remember that the answer inside absolute values always "outputs" as positive.

$|2-7|$ $|7-2|$

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Examples:

1/ $|-5-10|$

2/ $\dfrac{|9|}{|3-6|}$

3/ $\dfrac{|-8|}{-4}$

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Draw the following inequality on a number line.

$-4 \le x \le 4$

Recall: Closed circle $\le$ or $\ge$
Open circle $<$ or $>$

Is there another way to write this, if we are only interested in the magnitude of "x"?

$$|x| \le 4$$

Remember, we don't care about direction, only magnitude.

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What values would satisfy the following:
(two case method)

$|x| = 12$

$|x| = 135$

$|x| \leq 8$

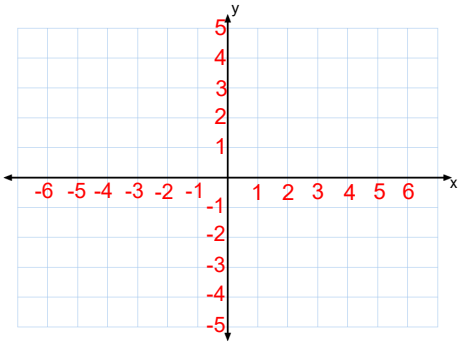
$|x + 2| \leq 5$

Aug 29-11:51 AM

What about graphing an absolute value function?

X	Y

$y = |x|$



This is the parent (base) curve for the absolute function.

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Now that you know the parent function then every other graph is just a transformation.

Ex: $y = |x + 2|$

$y = 3\left|\frac{1}{2}x\right|$

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Homework

p16 #2, 3ab, 4ab, 5ab, 6, 8(ignore the reference to #7), 10

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