

## 2.1

Friday, October 9, 2015 2:24 PM



### 2.1 Notes Blank

## Pre-Calculus 11 2.1 Absolute Value of a Real Number

### Notes

Name \_\_\_\_\_

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Absolute Value:

Absolute value is 'how many jumps the number is from zero'. Stated another way, it is the distance from zero on the number line, regardless of direction. Distances are always POSITIVE values. 3 is 3 jumps from zero, so the absolute value of 3, or  $|3| = 3$ . -3 is 3 jumps from zero, so  $|-3| = 3$ . So if  $|x| = 3$ , x could have been 3 OR -3. For every absolute value solution, there is a positive and negative possibility.

Examples- Evaluate

a)  $|5|$

$= 5$

b)  $|-7|$

$= 7$

c)  $|-0.34|$

$= 0.34$

d)  $|\frac{5}{6}|$

$= \frac{5}{6}$

e)  $|-6\frac{3}{8}|$

$= 6\frac{3}{8}$

Examples – What are the real numbers in order from least to greatest?

$|3.5|, -2, |-5.75|, 1.05, |\frac{-13}{4}|, |-0.5|, -1.25, |-3\frac{1}{3}|$

$3.5, -2, 5.75, 1.05, \frac{13}{4}, -0.5, -1.25, 3\frac{1}{3}$

$-2, -1.25, -0.5, 1.05, \frac{13}{4}, -3\frac{1}{3}, 3.5, 5.75$

Absolute value symbols should be treated in the same manner as brackets when applying order of operations (BEDMAS).

Examples – Evaluate the following

a)  $|-4| - |-3|$

$= 4 - 3$

$= 1$

b)  $2 - 3|(-12 + 8)|$

$= 2 - 3|-4|$

$= 2 - 3(4)$

$= 2 - 12$

$= -10$

you try

c)  $-2|-2(5-2)^2 + 6|$

$= -2|-2(3)^2 + 6|$

$= -2|-2(9) + 6|$

$= -2|-18 + 6|$

$= -2|-12|$

$= -2(12)$

$= -24$

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~~Radical Equations:~~

~~Recall  $\sqrt{a^2} = \sqrt{a^2}$~~

• Consider 25:  $25 = 5^2$  or  $(-5)^2$

• it has 2 roots,  $-5$  and  $5$

•  $+5$  is called the principal square root  
→ represents the pos. square root of 25.

✧ <sup>positive</sup> The **non-negative** square root of a non-negative real number,  $a$ , is called the principal square root <sup>positive</sup> of  $a$  and is written  $\sqrt{a}$ .

✧ Consider a square with area  $x^2$ . The side length of the square is positive, so it is the **principal square root** of  $x^2$ ; that is,  $\sqrt{x^2}$ . Since the principal square root is always positive  $\boxed{\sqrt{x^2} = |x|}$

Example – Evaluate  $\sqrt{(3-5)^2} = \sqrt{(-2)^2} = |-2| \stackrel{\text{abs. value}}{=} 2 \neq (-2)$

Use  $\sqrt{x^2} = |x|$

$= 2$

Assignment: p. 89 # 3, 5-7, 9, 11-14

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Assignment: