Name:_____ Date:_____

**Pre Calculus 11: HW Section 5.1 Evaluating Absolute Value Expressions: SOLUTIONS**

1. Evaluate each of the following:

| | | |
|---|---|---|
| a) $\lvert -22 \rvert$<br>22 | b) $\lvert 17-28 \rvert$<br>11 | c) $\lvert -(-3\times 20) \rvert$<br>60 |
| d) $\lvert -(23-44) \rvert$<br>21 | e) $-\lvert -(-41+12) \rvert$<br>$-29$ | f) $-\lvert 7-\lvert 3-18 \rvert \rvert$<br>-8 |
| g) $\lvert (30-35)+(18-26) \rvert$<br>13 | h) $\lvert 14-21 \rvert - 9\lvert 5-11 \rvert$<br>-47 | i) $-\lvert -5(5-11) \rvert$<br>-30 |
| j) $\frac{\lvert -24 \rvert}{-\lvert -4 \rvert}$<br>-6 | k) $3\lvert 11-3\lvert -6 \rvert \rvert$<br>21 | L) $-(23-18)^2-\lvert -4-8 \rvert^3$<br>-25 – (12 x 12 x 12)<br>-1753 |
| m) $\frac{\lvert -24 \rvert}{\lvert -34 \rvert - \lvert -4 \rvert}$<br>= 4/5 | n) $\frac{\lvert -8 \rvert + \lvert -5 \rvert}{\lvert -8 \rvert - \lvert -5 \rvert}$<br>=13/3 | o) $\frac{\lvert 12 \rvert + \lvert -8 \rvert}{\lvert -14 \rvert - \lvert -4 \rvert}$<br>= 2 |
| p) $\sqrt{(-15)^2}$<br>=15 | q) $\sqrt{223^2}$<br>223 | r) $\sqrt{(-2a^3b)^2}$<br>=2(a^3)b |

1. Solve the following equations for "x"

a) $|x+3|=10$

b) $|3x+4|=20$

X + 3 = 10 x + 3 = -10

X = 7 x = -13

c) $|5x-3|=12$

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

e) $|3x-13|-11=23$

f) $|12+18x|-17=-3$

c) $10-4|5x+7|=8$

d) $90-6|3-2x|=-15$

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

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

i) 12 ii) - 12 iii) 11 iv) 10 v) -36

Least: v) ii) iv) iii) i) Greatest

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

a – b = b -1 – b = -1
b – a = b – b + 1 = 1
Therefore the answer is 1

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

"a" can be positive 13 or negative 13

5. If you take the square root of 9, is it equal to "3" or "$\pm 3$"? Explain?

6. If you are solving the equation $x^2 = 9$ , is your answer equal to "3" or "$\pm 3$"? Explain?

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

a. $|a+b| = -5$ b) $-|2a| = 6$

a. The absolute value of a value is always positive. This expression will not get answer answers. A positive value can not be equal to a negative value.

b. Same as the first one. If you isolate the ABS value, it equals negative six. This will not give us any answers

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

c. This expression is correct. It is the definition of an abs value.
d. Yes, this expression is also correct. If you take the abs value of each expression, they both will be positive.

8. If $(a-b)^2 = 289$ and $(a+b)^2 = 169$, then what is the value of $|4ab|$ ?

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

a. $|a+b|=-5$

b) $-|2a|=6$

c. $\sqrt{(2a)^2}=|2a|$

d) $|a-b|=|b-a|$

10. Will the following equation have any solutions? Explain:

$|3x+2|+12=3$

11. Given that $|8x^2+3|=k$, for what values of "k" will there be no solutions? Explain:

12. If $(a-b)^2=289$ and $(a+b)^2=169$, then what is the value of $|4ab|$ ?

If $|x^2-12.5|=3.5$, then how many solutions are there? Explain:

13. The shortest distance between any point P(m,n) and a line with equation $Ax+By+C=0$ is given by the formula: $D=\frac{|Am+Bn+C|}{\sqrt{A^2+B^2}}$. 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?