Math in Living C O L O R !!

1.02 Signed Numbers, Absolute Value

Intermediate Algebra: One Step at a Time. **Pages 20 - 26: #77,80,81,84,85,86,88,92.**

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See Section 1.02 with explanations, examples, and exercises, coming soon!

P. 25:

77. $|-4|+3|-3|$

Well, that's what it looks like in black and white. Let's color it up a bit.

$|-4|+3|-3|$

Remember that $|-4|=4$ **and** $|-3|=3$

$|-4|+3|-3|$

$4+3\bullet 3$

$4+9$

13

80. $-3|-5|-5|-6|$ (or, in color $-3|-5|-5|-6|$)

Remember that $|-5|=5$ and $|-6|=6$

$$-3|-5|-5|-6|$$

$$-3\bullet 5-5\bullet 6$$

$$-15-30$$

$$-45$$

81. $-4|4-6|-8|-8+3|$

Here it is in color: $-4|4-6|-8|-8+3|$

Absolute value symbols are considered to be symbols of grouping, so they are treated as parentheses within the order of operations. In other words, you have to do what is within the absolute value bars first, as if they were parentheses.

$$-4|4-6|-8|-8+3|$$

$$-4|-2|-8|-5|$$

$$-4*2-8*5$$

$$-8-40$$

$$-48$$

84. $\left|-5-3\right|^2 - 4\left|7-2\right|$

In color perhaps it might look like this:

$$\left|-5-3\right|^2 - 4\left|7-2\right|$$

The first step is to combine the numbers inside each absolute value, as if these had been parentheses:

$$\left|-5-3\right|^2 - 4\left|7-2\right|$$

$$\left|-8\right|^2 - 4\left|5\right|$$

$$8^2 - 4 * 5$$

$$64 - 20$$

$$44$$

85. $\left|-8-5\right|^2 + \left|3-12\right|^2$

Colorizing it, it might look like this:

$$\left|-8-5\right|^2 + \left|3-12\right|^2$$

As before, the first step is to combine the numbers inside each absolute value.

$$\left|-13\right|^2 + \left|-9\right|^2$$

$$13^2 + 9^2$$

$$169 + 81$$

$$250$$

p. 26:

86. $\left|-8^2-5\right|+\left|3^2-12\right|$

In color: $\left|-8^2-5\right|+\left|3^2-12\right|$

Notice that when I "colorized" the problem above, I deliberately did NOT color the negative before the 8 to match the 8^2. It is very important to know that, since there were no parentheses around the -8, the only thing that gets squared is the 8! The negative before the 8 is NOT squared!

$$\left|-8^2-5\right|+\left|3^2-12\right|$$

$$\left|-64-5\right|+\left|9-12\right|$$

$$\left|-69\right|+\left|-3\right|$$

$$69+3$$

$$72$$

88. $-\left|-5^2-3^2\right|$

In color perhaps it should look like this:

$$-\left|-5^2-3^2\right|$$

Again notice that I deliberately did NOT color the negatives before the 5 and the 3 to match the 5 and the 3. It is very important to know that, since there were no parentheses around these negatives, these negatives are NOT to be squared!

$$-\left|-5^2-3^2\right|$$

$$-\left|-25-9\right|$$

$$-\left|-34\right|$$

$$-34$$

92. $$\frac{|-8^2+4|-|2^5-12|}{|-4-(-4)^2|}$$

The first step is Absolute Value (since these are symbols of grouping like parentheses!). Since are sometimes two or more operations within a set of absolute value symbols, it will take a couple of steps to do this. Start with the main trick here, and that is within the first absolute value: -8^2. You must square the 8, but NOT the negative. The result is -64. The first step, then, is to Raise to the Powers.

$$\frac{|-8^2+4|-|2^5-12|}{|-4-(-4)^2|}$$

$$\frac{|-64+4|-|32-12|}{|-4-16|}$$

$$\frac{|-60|-|20|}{|-20|}$$

Next, take the absolute values:

$$\frac{60-20}{20}$$

$$\frac{40}{20}$$

Final Answer: 2