

## Lesson #7 – Evaluating Exponents

Do Now:

- a) Write a general rule for multiplying two integers with the same sign.

Multiply the #'s, Answer will be positive

- b) Write a general rule for multiplying two integers with different signs.

Multiply the #'s, Answer will be negative

- c) Describe the difference between the rules for adding integers and multiplying integers.

Adding two negatives gives you a negative.

Multiplying two negatives gives you a positive.

Adding different signs, answer is the sign of the larger #

Multiplying different signs, answer is always negative.

Directions: Evaluate the following expression using multiplication.

$$\begin{array}{l} 1) \quad (-2)^2 \\ \quad (-2)(-2) \\ \quad 4 \end{array}$$

$$\begin{array}{l} 2) \quad (-3)^2 \\ \quad (-3)(-3) \\ \quad 9 \end{array}$$

$$\begin{array}{l} 3) \quad (-2)^3 \\ \quad (-2)(-2)(-2) \\ \quad 4(-2) \\ \quad -8 \end{array}$$

$$\begin{array}{l} 4) \quad -5^2 \\ \quad \downarrow \\ \quad -5 \cdot 5 \\ \quad -25 \end{array}$$

$$\begin{array}{l} 5) \quad -7^2 \\ \quad \downarrow \\ \quad -7 \cdot 7 \\ \quad -49 \end{array}$$

$$\begin{array}{l} 6) \quad -6^3 \\ \quad \downarrow \\ \quad -6 \cdot 6 \cdot 6 \\ \quad \quad \downarrow \\ \quad -36 \cdot 6 \\ \quad \quad \downarrow \\ \quad -216 \end{array}$$

$$\begin{array}{l} 7) \quad (-8)^2 \\ \quad (-8)(-8) \\ \quad 64 \end{array}$$

$$\begin{array}{l} 8) \quad -11^2 \\ \quad \downarrow \\ \quad -11 \cdot 11 \\ \quad -121 \end{array}$$

$$\begin{array}{l} 9) \quad -(-2)^4 \\ \quad \downarrow \\ \quad -(-2)(-2)(-2)(-2) \\ \quad \downarrow \\ \quad -4 \cdot (-2)(-2) \\ \quad \quad \downarrow \\ \quad \quad 8(-2) \\ \quad \quad -16 \end{array}$$

$$\begin{array}{l} 10) \quad 9 \cdot (-5)^2 \\ \quad 9 \cdot (-5)(-5) \\ \quad \quad \downarrow \\ \quad 9 \cdot 25 \\ \quad 225 \end{array}$$

$$\begin{array}{l} 11) \quad (-2)^3 \cdot (-6) \\ \quad (-2)(-2)(-2)(-6) \\ \quad \quad \downarrow \\ \quad \quad 4(-2)(-6) \\ \quad \quad \quad \downarrow \\ \quad \quad \quad -8(-6) \\ \quad \quad \quad 48 \end{array}$$

$$\begin{array}{l} 12) \quad -4 \cdot (-3)^2 \\ \quad -4 \cdot (-3)(-3) \\ \quad \quad \downarrow \\ \quad -4 \cdot 9 \\ \quad -36 \end{array}$$

13) Describe and correct the error in evaluating the expression.

$$-2 \cdot -7 = 14$$

~~X~~  $-2(-7) = -14$

a negative times a negative is a positive

14) Describe and correct the error in evaluating the expression.

$$\begin{array}{l} -10^2 \\ \downarrow \\ -10 \cdot 10 \\ -100 \end{array}$$

the answer should be negative

~~X~~  $-10^2 = 100$

**Directions:** Evaluate the expression when  $a = -2$ ,  $b = 3$ , and  $c = -8$ .

<p>15) <math>ab</math> <math>(-2)(3)</math> <math>-6</math></p>	<p>16) <math> a^2c </math> <math> (-2)^2(-8) </math> <math> (-2)(-2)(-8) </math> <math> 4(-8) </math> <math> -32 </math> <math>32</math></p>	<p>17) <math>-ab^3 - ac</math> <math>-\sqrt{(-2)(3)^3} - (-2)(-8)</math> <math>2 \cdot 3 \cdot 3 \cdot 3 - (-2)(-8)</math> <math>2 \cdot 27 - (-2)(-8)</math> <math>54 - 16</math> <math>38</math></p>
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**Directions:** Express each statement as an integer.

<p>18) The temperature is <math>-3^\circ\text{F}</math> at 7:00 a.m. During the next 4 hours, the temperature increases <math>21^\circ\text{F}</math>. What is the temperature at 11:00 a.m.?</p> $-3 + 21 = 18^\circ$	<p>19) Your bank account has a balance of <math>-\\$12</math>. You deposit <math>\\$60</math>. What is your new balance?</p> $-12 + 60 = \$48$
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