

Mini Lesson #1 - Evaluating and Simplifying Numerical Expressions

variable: letter or symbol that holds the place of number

expression: $1 + 1$ (no equal sign) math phrase that contains numbers, variables, & operation.

evaluate: replace variables with numbers and then work it out (simplify)

equivalent expressions: 2 expressions that have the same value

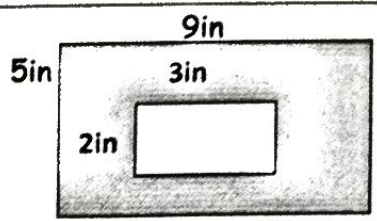
$1 + 5 = 3 + 3$

Key Terms: Word phrase can be translated into expressions. Fill in the chart below with words that mean each mathematical operation.

<p>UP</p> <p>+</p> <p>total in all</p>	<p>with</p> <p>-</p> <p>subtract</p>	<p>of</p> <p>x</p> <p>twice (x2)</p>	<p>separate</p> <p>÷</p>
<p>sum</p> <p>"all" together</p> <p>increase</p> <p>plus</p> <p>more</p> <p>add</p> <p>gain</p> <p>combine</p>	<p>take away</p> <p>give</p> <p>difference</p> <p>loss</p> <p>minus</p> <p>decrease</p> <p>less</p> <p>less than</p>	<p>product</p> <p>multiply</p> <p>times</p> <p>double (x2)</p> <p>by</p> <p>triple (x3)</p> <p>store</p>	<p>groups</p> <p>dividend</p> <p>divide</p> <p>quotient</p> <p>split</p> <p>each</p> <p>into</p>

• TRY IT: Translate each word phrase into a mathematical expression.

1. Six less than x	2. The product of 3 and m $3 \cdot m$ or $3m$
3. 7 more than the difference of 14 and the number m	4. Double k $2k$ or $2 \cdot k$
5. The quotient of n and 15 plus 16	6. \$24 less than the sale price



*shape is not drawn to scale! Write 2 different expressions you could use to find the area of each shaded figure.

Order of Operations: You and your partner discuss order of operations and describe below how order of operations work.

ORDER OF OPERATIONS

- 1) Grouping Symbols () [] { } —
- 2) Exponents 3^2 (square) 2^3 (cubed) $2 \cdot 2 \cdot 2 = 8$
- 3) Mult or div (left to right) $3 \cdot 3 = 9$
- 4) Add or Sub (left to right)

TRY IT: Simplify the following expressions. SHOW WORK!

$$1. 10 \div [9 - (2 \cdot 2)] = \boxed{2}$$

$10 \div [$

$$2. 2[(13 - 4) \div 3] = \boxed{6}$$

$$3. 3^2 + \frac{10-2}{4} = \boxed{11}$$

$$4. 8 - 4 + 2 \cdot 6 \div 3 = \boxed{8}$$

$8 - 4 + 4$
 $4 + 4$

$$5. 20 - 3[(15 - 3) \div 3] = \boxed{8}$$

$20 - 3[12 \div 3]$

$20 - 3 \cdot 4$
 $20 - 12$

$$6. -3(5) + \frac{4+6}{5-3} - 8(6-2) = \boxed{-22}$$

$$-3 \cdot 5 + 5 - 3 \cdot 4$$

$$-15 + 5 = -10$$

$$-10 + 12 = -22$$

EVALUATE: Replace the variable with the given number and then use order of operations to simplify the expression. Make sure you rewrite the expressions with the numbers!

TRY IT: Simplify the following expressions. SHOW WORK!

1. $4y - 15$ for $y = 19$

$$4 \cdot 19 - 15$$
$$76 - 15 = \boxed{61}$$

2. $4(t + 3)$ for $t = 8$

$$4(8 + 3)$$
$$4 \cdot 11 = \boxed{44}$$

3. $3ab + \frac{c}{2}$ for $a = 4$, $b = 5$, $c = -10$

$$3 \cdot 4 \cdot 5 + \frac{-10}{2}$$
$$60 + -5 = \boxed{55}$$

4. ab^2 for $a = -2$ and $b = 3$

$$-2 \cdot (3^2)$$
$$-2 \cdot 9 = \boxed{-18}$$

5. a^2 for $a = -4$

$$(-4)^2$$
$$\boxed{16}$$

$$-4^2$$
$$-16$$

$$-(4^2)$$
$$-16$$

6. $-a^2$ for $a = -4$

$$-(-4)^2$$
$$\boxed{-16}$$

$$-1 \cdot a^2$$

7. $\frac{mn^2}{8}$ for $m = -2$, $n = 4$

$$\frac{-2(4^2)}{8}$$

$$-2 \cdot 16 = \frac{-32}{8}$$

$$\boxed{-4}$$