## 1.1: Evaluate Expressions

Goals: *Evaluate algebraic expressions using basic operations
*Evaluate algebraic expressions using exponents

Variable - $\qquad$ letter $\qquad$ , or symbol, used to represent one or more $\qquad$ numbers $\qquad$ .

Ex: $x, y, z \ldots$

Value - the $\qquad$ number $\qquad$ that replaces a variable.

Ex: If $x$ is the variable and $x=3$, the value of the variable is 3 .

Expression - __math $\qquad$ sentence that has $\qquad$ numbers $\qquad$ , operations $\qquad$ , and
$\qquad$ _variables $\qquad$ . (**It does NOT have an $\qquad$ equals $\qquad$ sign $\qquad$ !!!)

Ex: $5+x$

Algebraic expression - an $\qquad$ expression $\qquad$ that has at least one $\qquad$ variable $\qquad$ .

## Algebraic Expression

1. $\frac{14}{y}$
2. $5+c$
3. $6 n$
4. $4-x$

4 minus $x$
Subtraction
**Do NOT use $\qquad$ x to show multiplication anymore! *It is too easy to get confused with a variable. Use parenthesis, middle dot, or don't need anything if it is a number and a variable.

1. Write down the $\qquad$ expression $\qquad$ .

Ex: Evaluate $13 n$ when $n=3$
2. $\qquad$ Substitute $\qquad$ , or change the variable to
its $\qquad$ value $\qquad$ .
3. Simplify. (Do the $\qquad$ math $\qquad$ _)
*Be sure to follow $\qquad$ PEMDAS $\qquad$ if there is more than one step.

## Evaluate when $\boldsymbol{n}=3$.

Ex: $\frac{9}{n}$
Ex: $n-1$
Ex: $n+8$
$\frac{9}{3}$
3-1
$3+8$

3
2
11

Evaluate when $\boldsymbol{y}=2$.

Ex: $6 y$
Ex: $\frac{8}{y}$
Ex: $y+4$
$\frac{8}{2}$
$2+4$
6

Evaluate when $c=4$.
Ex: $4 c$
Ex: $15+c$
Ex: $17-c$
$15+4$
19

Ex: The total cost of going to the movies can be represented by the expression $a+r$ where $a$ is the cost of admission and $r$ is the cost of refreshments. Suppose you pay $\$ 7.50$ for admission and $\$ 7.25$ for refreshments, find the total cost of going to the movies.

$$
\begin{aligned}
& a+r \\
& 7.50+7.25 \\
& 14.75
\end{aligned}
$$

## Exponents:

Power: an expression that represents repeated multiplication

Base: $\quad$ The number that is being repeatedly multiplied

Exponent: The number of times to multiply the base. Written top right corner of the base

Ex: $3^{4}=3 \cdot 3 \cdot 3 \cdot 3 \quad=81$

Say in words and write out as multiplication:

Ex: $\mathbf{5}^{\mathbf{2}}=5.5$
" 5 squared" or " 5 to the second power"

Ex: $7^{1}=7$
" 7 " or " 7 to the first power"

Ex: $\left(\frac{1}{2}\right)^{3}=\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$
"one half cubed" or "one half to the third power"

Evaluate the expressions for the given values.
(2) ${ }^{4}$
$2 \cdot 2 \cdot 2 \cdot 2$
16
Ex: $x^{3}, x=8$
512
Ex: $n^{3}, n=1.5$
$(1.5)^{3}$
$1.5 \cdot 1.5 \cdot 1.5$
3.375

Ex: $k^{2}, k=2.5$
6.25

Ex: $y^{5}, y=3$
$(3)^{5}$
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Ex: $d^{4} ; d=1$

Ex: The edge of a medium-size storage cube is 14 inches long. Find the volume of the storage cube.
To find volume use the expression $s^{3}$
$(14)^{3}$
2,744 inches ${ }^{3}$

Ex: Find the area of a square garden whose side length is 22 feet.
To find area of a square use the expression $s^{2}$
(22) ${ }^{2}$
$484 \mathrm{ft}^{2}$

