Evaluating Expressions

1) Replace variables with values

2) Simplify the expression using the order of operations

PEMDAS

$4x-6+(26+y-4y)$

$x = 14, y = 8$

$4(14)-6+(26+8-4y)$

$4(14)-6-15$

$56-6-15$

35

The formula used to find the area of a triangle is $A = \frac{1}{2}$ base · height. What is the area of a triangle with base of 8in. and a height of 13in?

$\frac{1}{2}(8)(13)$

52

$19+[7p-3k]+19-4^2$

$k = 5, p = 10$

$19+[7(10)-3(5)]+19-4^2$

$19+[70-15]+19-4^2$

$19+55+19-16$

77

Evaluating Linear and Exponential Expressions

Name: _____

1. The expression ½ t + 24 models changing river heights. t represents the time (in hours) since the flooding began. The river started at a height of 24 feet.

   What will be the height of the river after 12 hours? (when t = 12)

   $\frac{1}{2}t + 24$ $\quad \frac{1}{2}(12) + 24 = 30$ ft

2. The expression 15t + 25 models changing speeds of a car (in mph) as it enters an expressway. t represents the time (in minutes).

   What will the speed of the car be after 4 minutes? (when t=4) $15t + 25$ $\quad 15(4) + 25 = 85$ mph

3. The expression $25(1.06)^x$ represents interest earned in a savings account that initially had $25 in it. x represents the number since investment, since the interest grows at 6% each year.

   How much money will be in the account after 17 years? $25(1.06)^{17} = \$67.32$

Create an expression for the scenarios below. Then, evaluate the expression given a value for the unknown.

4. A science experiment involves periodically measuring the number of mold cells present on a piece of bread. At the start of the experiment, there are 50 mold cells. Each time a periodic observation is made, the number of mold cells triples. Let x represent the number of observations.

   Expression: $50 \cdot 3^x$

   How many cells will there be after 6 observations? $50 \cdot 3^6 = 36{,}450$ cells

5. A motor scooter purchased for $1000 depreciates at an annual rate of 15%. Let x = number of years since purchase.

   Expression: $1000(1-.15)^x \rightarrow 1000(.85)^x$

   How much will the scooter be worth after 5 years? $1000(.85)^5 = \$443.71$

6. You have $5,000 saved in a bank that earns 3% annual interest. Write an expression to represent the total money in the bank after x years.

   Expression: $5000(1.03)^x$

   How much will be in the bank after 11 years? $5000(1.03)^{11} = \$6921.17$

7. A sunflower in Julia Rosario's garden was 12 centimeters tall when it was first planted. Since then, it has grown approximately 0.6 centimeters per day. Let x= number of days passed.

   Expression: $12 + .6x$

   How tall will the flower be after 18 days? $12 + .6(18) = 22.8$ cm

Evaluating Linear and Exponential Expressions

Name: _____

8. The cost of a school banquet is $95 plus $15 for each person attending. Let x= the number of people who attended.

   Expression: $15x + 95$

   How much will the total cost be for the school if 77 people attend? $15(77) + 95 = \$1250$

9. Your family spends $80 for tickets to a baseball game and $3 per hour for parking. Let x= the number of hours parked.

   Expression: $3x + 80$

   What will the total cost be for the family if they park for 10 hours? $3(10) + 80 = \$110$

10. In 1990, Georgia recorded a population of 8,186,453. The population increased at an annual rate of 3.67% per year.

    Expression: $8186453(1.0367)^x$

    What is the expected population for 2018?

    $x = 28$ $8186453(1.0367)^{28} =$ 22,458,592 people

Remember to study for your test!!! Study the notes in your composition notebook (Pages 10-13).

Vocab:

E	1. Algebraic Expression	A. Each part of an expression separated by an operation (+,-)
C	2. Coefficient	B. A number that stands by itself
B	3. Constant	C. A number that does not stand by itself. It is attached to the variable.
A	4. Term	D. A letter that stands for a particular numerical value
D	5. Variable	E. A number sentence without an equal sign, has at least one two terms and one operation

Using the following expression: **$4x^3 + 5yz^4 + 179x - 19w + 10235$**

Identify the:

Terms: $4x^3, 5yz^4, 179x, -19w, 10235$

Coefficients: $4, 5, 179, -19$

Constants: 10235

Factors: 4 and x^3, 5 and y and z^4, 179 and x, -19 and w

Variables: x, y, z, w

Also, study how to evaluate expressions. And study how to write and evaluate exponential and linear expressions.

Evaluating Expressions

To evaluate an expression means to substitute *each variable with its numerical value.*

Then, use the order of operations *to simplify.*

EXAMPLE 1 **Evaluate 6x – 7 if x = 8**

$6(8)-7$

$48-7=\boxed{41}$

EXAMPLE 2 **Evaluate $\frac{ab}{3}$ if a = 7 and b = 6**

$\frac{(7\times 6)}{3}=\frac{42}{3}=\boxed{14}$

You Try!

Evaluate the following if x = 6, y = 8, and z = 3

1. $xy+z$

$6(8)+3$

$48+3=\boxed{51}$

2. $yz-x$

$8(3)-6$

$24-6=\boxed{18}$

3. $2x+3y-z$

$2(6)+3(8)-3$

$12+24-3=\boxed{33}$

4. $2(x+z)-y$

$2(6+3)-8$

$2(9)-8$

$18-8=\boxed{10}$

5. $3z+(y-x)$

$3(3)+(8-6)$

$9+2=\boxed{11}$

6. $5x-(y+2z)$

$5(6)-(8+2(3))$

$30-(8+6)=30-14$

$=\boxed{16}$

7. x^2+y^2-10z

$6^2+8^2-10(3)$

$36+64-30=\boxed{70}$

8. $z^3+(y^2-4x)$

$3^3+(8^2-4(6))$

$27+(64-24)$

$27+40=\boxed{67}$

9. $\frac{y+xz}{2}$

$\frac{8+6(3)}{2}=\frac{26}{2}=\boxed{13}$

10. $\frac{3y+x^2}{z}$

$\frac{3(8)+6^2}{3}=\frac{24+36}{3}=\frac{60}{3}$

$=\boxed{20}$