

Simplify the following expressions. Identify the terms, the constant term and the factors & coefficients of the non-constant terms.

1. $12x^3 + 16x + 4$

Handwritten notes:
 - coefficient (pointing to 12)
 Factors: 12, x^3 , 16, x , constant (pointing to 4)

2. $21x^2 + 3x - 15x^2 + 9$

Handwritten notes:
 $6x^2 + 3x + 9$
 coefficient (pointing to 6), Factors: 6, x^2 , coefficient (pointing to 3), Factors: 3, x , constant (pointing to 9)

Translate:

3. half the sum of a number and 5 $\frac{x+5}{2}$ $\frac{1}{2}(x+5)$

4. The product of 8 and the cube of a number increased by the difference of 6 and the same number squared $8x^3 + 6 - x^2$

Interpreting Linear Expressions

Notes

Algebraic expressions used to describe situations contain variables

Key Concepts:

-Translate the situation into an expression

$$x+5$$

$x \rightarrow$ test score

-As variables change, constant terms WILL NOT change

$$x+12$$

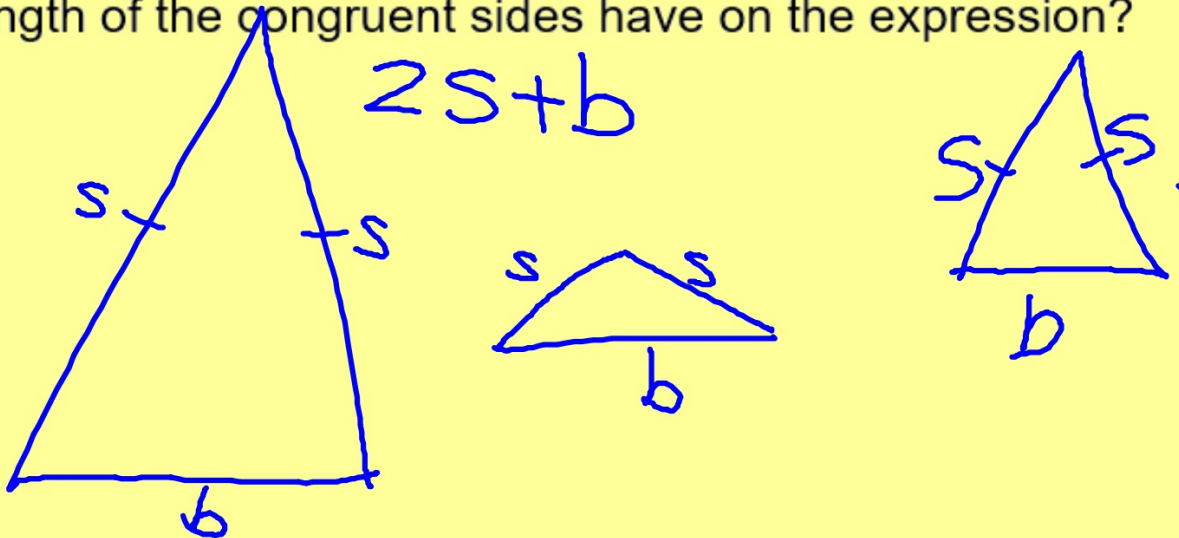
-As constants change, terms containing variables WILL NOT change

-Follow the Order of Operations

Example 1



To calculate the perimeter of an isosceles triangle, the expression $2s + b$ is used, where s represents the length of the two congruent sides and b represents the length of the base. What effect, if any, does increasing the length of the congruent sides have on the expression?



Example 2

Money deposited in a bank account earns interest on the initial amount deposited as well as any interest earned as time passes. This simple interest can be described by the expression $P(1 + rn)$, where P represents the initial amount deposited, r represents the interest rate, and n represents the number of years that pass. How does a change in each variable affect the value of the expression?

$$P(1 + rn)$$

$P \rightarrow$ \$ put in
 $r \rightarrow$ interest rate
 $n \rightarrow$ years

SOLVING MULTI- STEP EQUATIONS

SOLVING EQUATIONS

**1. Distribute &
Combine Like Terms**

2. Get all variables to the LEFT side

**3. Add/Subtract
THEN Multiply/Divide**

$$1) \quad 9x + 1 - 7x - 5 = -20$$

$$2x \quad \cancel{-4} = -20$$
$$\qquad \quad \quad \cancel{+4} \quad +4$$

$$\hline 2x = -16$$
$$\cancel{2} \qquad \qquad \quad \cancel{2}$$

$$x = -8$$

$$2) \quad -7(3a - 1) = 91$$

$$-21a \quad \cancel{+7} = 91$$
$$\qquad \qquad \quad \cancel{-7} \quad -7$$

$$\hline -21a = 84$$
$$\cancel{-21} \qquad \quad \cancel{-21}$$

$$a = -4$$

$$3) 4m - 5(3m + 10) = 126$$

$$\textcircled{4m} - \textcircled{15m} - 50 = 126$$

$$-11m - 50 = 126$$

$$+50 \quad +50$$

$$\hline -11m = 176$$

$$\frac{-11}{-11} \quad \frac{176}{-11}$$

$$\boxed{m = -16}$$

$$4) -3(k - 8) - 1(k + 5) = 23$$

$$-3(k - 8) - k - 5 = 23$$

$$\textcircled{-3k} + \textcircled{24} - \textcircled{k} - \textcircled{5} = 23$$

$$-4k + 19 = 23$$

$$-19 \quad -19$$

$$\hline -4k = 4$$

$$\frac{-4}{-4} \quad \frac{4}{-4}$$

$$\boxed{k = -1}$$

$$5) \quad 10x - 6(2x + 5) = 20$$

$$\textcircled{10x} - \textcircled{12x} - 30 = 20$$

$$-2x - \cancel{30} = 20$$
$$\quad \quad \quad \cancel{+30} \quad +30$$

$$-2x = 50$$
$$\underline{\quad -2} \quad \underline{\quad -2}$$

$$\boxed{x = -25}$$