Variables and Expressions

Variables

A variable is a symbol that represents a number. Usually we use letters such as n, t, or x for variables. For example, we might say that s stands for the side-length of a square. We now treat s as if it were a number we could use. The perimeter of the square is given by $4 * s$. The area of the square is given by $s * s$. When working with variables, it can be helpful to use a letter that will remind you of what the variable stands for: let n be the number of people in a movie theater; let t be the time it takes to travel somewhere; let d be the distance from my house to the park.

s^2

Expressions

An expression is a mathematical statement that may use numbers, variables, or both. A **variable expression** contains at least one variable. A **numerical expression** contains just numbers.

The following are examples of expressions. Identify each as a numerical expression or variable expression. For each variable expression, name the variable.

2   _numerical_ x _Variable, x_

$3 + 7$ _numerical_ $2y + 5$ _Variable, y_

$2 + 6(4 - 2)$ _numerical_ $z + 3(8 - z)$ _Variable, z_

Translating words into expressions

Certain words can be translated into math operation symbols. Write the correct symbol beside each given word(s). Use $+$, $-$, $*$, or $\div$

less than ___$-$___   times ___$*$___   more than ___$+$___

                                                            $\frac{1}{2} \cdot 50$ $.75 \cdot 26$

increased by ___$+$___   (product) ___$*$___   of ___$*$___

(difference) ___$-$___   (quotient) ___$\div$___   (sum) ___$+$___

                                                                  $\div 2$

decreased by ___$-$___   twice ___$* 2$___   half ___$* \frac{1}{2}$___

total ___$+$___   double ___$* 2$___   quadruple ___$* 4$___

'Quantity' means use parentheses around the next expression.

For example, 5 times the quantity of 18 minus h $5(18 - h)$

Write a variable expression for each word phrase.

1. The sum of 6 and x ___ $6 + x$ or $x + 6$

2. m multiplied by 11 ___ $11m$

3. 13 less h ___ $13 - h$

4. 13 less than h ___ $h - 13$ $m - 1$

5. 5 times the (sum) of n and 8 ___ $5(n + 8)$

6. 16 less than the (product) of m and -1 ___ $-1m - 16$

7. y decreased by the product of y and 2 ___ $\cancel{2y \cdot y}$
   $y - 2y$

Write an expression for each quantity.

8. the value in cents of (5) quarters ___ $25 \cdot 5$ the value in cents of (q) quarters ___ $25q$

9. the number of days in (3) weeks ___ $7 \cdot 3$ the number of days in (w) weeks ___ $7w$

10. the number of hours in (240) minutes ___ $\dfrac{240}{60}$ the number of hours in (m) minutes ___ $\dfrac{m}{60}$

11. the number of meters in (400) cm ___ $\dfrac{400}{100}$ the number of meters in (c) centimeters ___ $\dfrac{c}{100}$

cent (100) $100 cm = 1m$

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HOMEWORK

Identify each as a <u>numerical</u> expression or <u>variable</u> expression. For each variable expression, name the variable.

1. $4c$ _____   2. $74 + 8$ _____

3. $\dfrac{4(9)}{6}$ _____   4. $14 - r$ _____

5. $25k - 9$ _____   6. $3 + 3 + 3 + 3$ _____

7. $19 + 3(12)$ _____   8. $25 - 8 + x$ _____

Homework is continued on the next page. ⟹