

Translating Words into Mathematical Symbols

ADDITION

- sum
- increased by
- plus
- more than
- added to
- the total of

EXAMPLES: Write the phrase as a variable expression. Let x represent the number.

1. fifteen more than a number

$$15 + x$$

2. the sum of a number and eight

$$x + 8$$

SUBTRACTION

- difference
- decreased by
- minus
- *• less than ^{FLIP order}
- subtracted to / ^{from}
- less ^{"minus"}

3. a number decreased by three

$$x - 3$$

4. twenty-seven ^{FLIP} less than a number

$$x - 27$$

5. the difference of nine and a number

$$9 - x$$

6. a number ^{"minus"} less one

$$x - 1$$

MULTIPLICATION

- product
- multiplied by
- times
- of

7. the product of eighty-five and a number

$$85x$$

8. one-half of a number

$$\frac{1}{2}x$$

9. twenty times a number

$$20x$$

* write in the form of a fraction

DIVISION

order matters

- quotient
- divided by
- the ratio of


10. the quotient of eleven and a number

$$\frac{11}{x}$$

11. a number divided by three

$$\frac{x}{3}$$

PHRASE  EXPRESSION

SENTENCE  EQUATION OR INEQUALITY

The sentence will have one of the following:

- is =
- is less than <
- is greater than >
- is less than or equal to \leq no more than
- is greater than or equal to \geq no less than

Write the sentence as an equation or inequality.

12. The ^{div.} quotient of seven and a number is twenty-one.

$$\frac{7}{n} = 21$$

13. The ^{add.} sum of a number and three is greater than or equal to eight.

$$x + 3 \geq 8$$

14. Two-thirds ^{mult.} of a number is less than nine.

$$\frac{2}{3}x < 9$$

Write the sentence as an equation or inequality.

15. Four ^{subtract} less than the ^{add} sum of a number and five is no more than twenty.

$$(x + 5) - 4 \leq 20$$

16. A number squared ^{exp of 2} increased by ^{addition} the difference ^{subtraction} of six and a number is fifteen.

$$x^2 + (6 - x) = 15$$

17. Two ^{mult.} times the quantity ^{addition} two more than a number is greater than seven.

$$2(2 + x) > 7$$

18. a) Translate into mathematical symbols:
 "A number divided by four is seven."
 Let y represent the number.

$$\frac{y}{4} = 7$$

- b) Use mental math to solve the equation.

$$y = 28$$

- c) Check your solution.

$$\frac{28}{4} \stackrel{?}{=} 7$$

$$7 = 7 \checkmark$$

19. You make a long distance phone call. The rate is \$0.10 for each minute. The total cost of the call is \$5.00. How long was the call?

$$x = \# \text{ of minutes}$$

$$\frac{.10x}{.10} = \frac{5.00}{.10}$$

$$x = 50 \text{ minutes}$$

PROBLEM SOLVING PLAN USING MODELS

VERBAL MODEL

What do you need to know?
Write a model.

↓
LABELS

Assign labels to your model.

↓
ALGEBRAIC MODEL

Translate your words to symbols.

↓
SOLVE

Solve.

↓
~~CHECK~~

Check that your answer is reasonable.

20. You want two rectangular gardens to have equal areas. The first garden is 5 meters by 16 meters. The second garden is 8 meters wide. How long should the second garden be?

$A = l \cdot w$

$l \cdot 8 = 16 \cdot 5$
 $\frac{l \cdot 8}{8} = \frac{80}{8}$
 $l = 10 \text{ meters}$