

Unit 4 - Using Equations to Solve Word Problems

Lesson 1

Writing Equations Section 7.7 Pages 362-363	List as many mathematical words possible for +, -, x, \div Changing sentences into equations ("is" often means "=") Word Problem Format: 1) Givens: 2) Find: 3) Let.... Classwork: Pg 363 -1, 2, 5, 7, 12, 19, 20, 22, 24, 25a Homework: Pg 363 - 3, 4, 6, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 21, 23, 25b, 26a, b
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Notes:
= is, equal to, equals

+ add, plus, and, combine, sum, increasing, more than
 - minus, subtract, decrease, take away, less than, difference
 x times, product, of, multiply, together
 \div quotient, divide, group

Classwork: Pg. 363

Match each sentence with the correct equation.

1. Three times a number is equal to eighteen.

2. A number decreased by six is four.

5. A number divided by four is eighteen.

$$x - 4 = 10$$

$$3x = 18$$

$$\frac{m}{4} = 18$$

$$y - 6 = 4$$

$$x + 4 = 18$$

Write an equation to model each sentence.

7. A number divided by two equals five.

$$\frac{x}{2} = 5$$

$$x \div 2 = 5$$

12. The square of a number is twenty-five.

$$x^2 = 25$$

$$x = \pm 5$$

19. A number decreased by six is negative eight.

$$n - 6 = -8$$

Applications and Problem Solving

Write an equation to model the situations in questions 20-24.

Solve.

20. Piano keys There are 16 more white keys than black keys on a full-sized piano keyboard.

Let b be the number of black keys
Then $b+16$ is the number of white keys

Missing info $\rightarrow 88$ keys!

$$(b + 16) + b = 88$$

$$2b + 16 = 88$$

$$2b = 88 - 16$$

$$2b = 72$$

$$\rightarrow \therefore b = 36$$

\therefore There are 36 black keys.

22. Ages Mike is seven years older than Ayla.
The sum of their ages is 29. How old is Mike?

Let x be Ayla's age
Then Mike is $x + 7$

$$x + (x + 7) = 29$$

$$2x + 7 = 29$$

$$2x = 22$$

$$x = 11$$

\therefore Mike is $11 + 7 = 18$ years old

24. Populations The population of Japan is about 4.2 times the population of Canada. The sum of the populations is about 155 000 000.

Let x be the population of Canada
 Then Japan's population $4.2x$

$$(4.2x) + x = 155\,000\,000$$

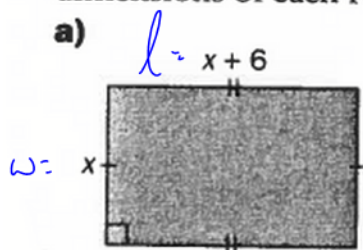
$$5.2x = 155\,000\,000$$

$$x = \frac{155\,000\,000}{5.2} \quad \leftarrow \text{million}$$

$$\approx 29\,800\,000 \quad \leftarrow \text{round to the nearest million}$$

25. Measurement The perimeter of each rectangle is 36 cm. Write an equation to find the dimensions of each rectangle.

a)



$$\begin{aligned} P &= w + l + w + l \\ &= 2(w + l) \end{aligned}$$

$$36 = 2(x + x + 6)$$

$$2(2x + 6) = 36$$

$$4x + 12 = 36$$

$$4x = 24$$

$$x = 6$$

\therefore The width is 6 cm \therefore The length is 12 cm.