7th Grade

3.1 Write Expressions, Equations and Inequalities

Variable: a letter that represents any number, a placeholder

turn to page 150 in your book, read the comic and answer the 4 questions below it.

1. Suppose the daughter is 12 years old. How old is the son? 12+3 = 15 yrs old
2. What operation did you use to find the son's age? Explain. Add ; older than
3. Suppose the comic said that *the son is twice as old as the daughter.* If the daughter is 12 years old, how old is the son? 24
4. What operation did you use to find the son's age? Explain.

x2 twice

Words and phrases in problems often suggest addition, subtraction, multiplication, and division. Here are some examples.

Addition and Subtraction		Multiplication and Division	
plus	minus	times	divided
sum	difference	product	quotient
more than	less than	multiplied	per
increased by	less	twice x 2	separate
in all	decreased by	each	
		of	

switch the order of the #'s

EXAMPLE **Write a Phrase as an Expression**

1 Write the phrase *five dollars less than Jennifer earned* as an algebraic expression.

j − 5

2) Write the phrase twenty dollars less the price of a movie ticket as an algebraic expression.

20 − m

mult. a # & a variable
- do not need a times sign
- # must go 1st

Your Turn Write each phrase as an algebraic expression.

a. twice as many tomatoes as last year $2t$

b. 3 more runs than the Pirates scored $r + 3$

3 + x

Remember, an equation is a sentence in mathematics that contains an equals sign. When you write a verbal sentence as an equation, you can use the equals sign (=) for the words *equals* or *is*.

3) Five more than a number is 20.

$5 + n = 20$

or $n+5=20$

4) Three times Jack's age equals 12.

$3 \cdot j = 12$

$3j = 12$

5) **FOOD** It is estimated that 12.4 million pounds of potato chips were consumed during a recent Super Bowl. This was 3.1 million pounds more than the number of pounds of tortilla chips consumed. Write an equation that models this situation.

$3.1 + p = 12.4$

or

$12.4 = 3.1 + p$

You Try:

a) A number less 4 is 12.

$n - 4 = 12$

b) Twice a number is 18.

$2n = 18$

c) **FOOD** An average American adult drinks more soft drinks than any other beverage each year. Three times the number of gallons of soft drinks plus 27 is equal to the total 183 gallons of beverages consumed. Write an equation that models this situation.

$3 \cdot g + 27 = 183$

$3g + 27 = 183$

Inequality symbols

$>$ is greater than, is more than

$<$ is less than, is smaller than

$x < 6$ 5, 4, 3, 2, 1, 0, ...

$\leq$ is less than or equal to, is at most, is no more than, is fewer than

$x \leq 6$ 6, 5, 4, 3, 2, ...

$\geq$ is greater than or equal to, is at least

$x \geq 6$ 6, 7, 8, 9, ...

Translate the sentence.

6) Four more than twice a number is at most 32

$4 + 2 \cdot n \leq 32$

$4 + 2n \leq 32$

or

$2n + 4 \leq 32$

Translate the sentence.

7) A number decreased by 5 is at least 21.

$n - 5 \geq 21$

8) Negative eight times a number is no more than sixteen.

$-8 \cdot x \leq 16$ $-8x \leq 16$

9) The sum of a number and 3 is no less than 28.

$n + 3 \geq 28$

You Try:

a) Twenty is at most a number decreased by five.

$20 \leq n - 5$

b) Six plus four times a number is no bigger than eighteen.

$6 + 4n \leq 18$

Homework

pg. 152; 10-25, 28, 29, 31-39