

1.4 Write Equations and Inequalities

Before

You translated verbal phrases into expressions.

Now

You will translate verbal sentences into equations or inequalities.

Why

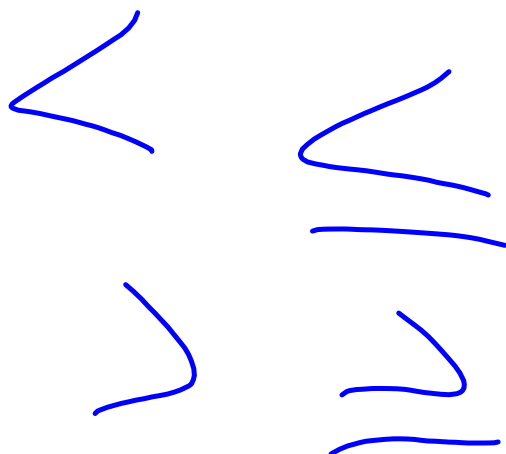
So you can calculate team competition statistics, as in Ex. 41.



An **equation** is a mathematical sentence formed by placing the symbol $=$ between two expressions. An **inequality** is a mathematical sentence formed by placing one of the symbols $<$, \leq , $>$, or \geq between two expressions.

An **open sentence** is an equation or an inequality that contains an algebraic expression.

$$4x + 7 \geq 47$$



KEY CONCEPT*For Your Notebook*

Symbol	Meaning	Associated Words
$=$	is equal to	the same as
$<$	is less than	fewer than
\leq	is <u>less than</u> or equal to	* at <u>most</u> , no more than
$>$	is greater than	more than
\geq	is <u>greater than</u> or equal to	* at <u>least</u> , no less than

LESSON
1.4**Practice A***For use with the lesson "Write Equations and Inequalities"***Match the verbal sentence with its equation or inequality.**

1. The difference of 4 and a number n is equal to 14.

A. $n - 4 \leq 14$

2. The difference of a number n and 4 is no more than 14.

B. $n - 14 \leq 4$

3. The difference of 4 and a number n is at least 14.

C. $4 - n = 14$

4. The difference of a number n and 14 is at most 4.

D. $4 - n \geq 14$

Write an equation or an inequality.

- 5.** The sum of 8 and a number n is equal to 15.
- 6.** The product of 5 and a number y is at least 22.
- 7.** The difference of a number x and 6 is 19.
- 8.** The quotient of a number b and 7 is more than 25.

Check whether the given number is a solution of the equation or inequality.

9. $x + 14 = 19$; 5

10. $2m + 3 = 11$; 3

11. $\frac{b}{3} + 4 = 7$; 9

$$\begin{aligned}x &\rightarrow 14 = 19 \\5 &\rightarrow 14 = 19 \\19 &= 19 \\\checkmark 4 \in 5\end{aligned}$$

12. $4a - 5 \leq 10; 4$

13. $22 - y > 13; 8$

14. $\frac{p}{5} - 8 > 1; 40$

$$4 \cdot 4 - 5 \leq 10$$

$$16 - 5 \leq 10$$

$$11 \leq 10$$

NO

$$22 - 8 > 13$$

$$14 > 13$$

✓ YES

Solve the equation using mental math.

15. $x + 17 = 22$

16. $y + 4 = 16$

17. $m - 8 = 12$

$$\begin{array}{l} 12? \\ 12 + 4 = 16 \\ 16 = 16 \\ \checkmark \end{array}$$

18. $10c = 50$

$$\begin{array}{l} 5? \\ 10 \cdot 5 = 50 \\ 50 = 50 \checkmark \end{array}$$

19. $3w = 36$

$$\begin{array}{l} \frac{A}{6} = 3 \\ 18? \\ \frac{18}{6} = 3 \\ 3 = 3 \checkmark \end{array}$$

20. $\frac{a}{6} = 3$

- 21. Locker Installation** Your school is replacing a section of old lockers. When the old lockers are removed, there is a space that is 165 inches long. Each new locker has a width of 11 inches. You write the equation $11x = 165$ to model the situation. What do the 11, x , and 165 represent? Use mental math to solve the equation.

- 22. Snowboarding** You have saved \$78 to buy a snowboard that costs \$150. How much more money do you need to save to be able to buy the snowboard?

$$\begin{array}{r} 150 \\ - 78 \\ \hline 72 \end{array}$$

$$78 + m = 150$$

- 23. Die-Cast Cars** You buy a storage case that holds 150 collectible die-cast cars. You have 132 die-cast cars. Write an inequality that describes how many more cars you can buy and still have no more cars than the case will hold. You buy 24 cars. Will they all fit in the case?

$$150 \geq 132 + X$$

$$X + 132 \leq 150$$

$$24 + 132 \leq 150$$

$$156 \leq 150 \quad \text{No}$$