Get out your book and turn to page 129. Solve the equation below to warm up!

Classwork - Writing Two Step Equations

WARM UP. Solve

$$3(2x-4)-4(x+6) = -40$$

$$(6x)-12(-4x)-24(--40)$$

$$-2x-3(6+-40)$$

$$-3(6+-40)$$

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$$-3$$



**Robotics** You want to attend a two-week robotic day camp that costs \$700. Your parents will pay the deposit of \$400 if you pay the rest in weekly payments of \$15. Use the questions below to help you find the number of weeks you will need to make payments.

 Complete the table below. How much is paid after 2, 3, and 4 weeks?

Payments	Amount Paid	
0	400 + 15(0) = 400	
1	400 + 15(1) = 415	1
2	400+15(S) = 43	6
3		
4		

- It will take a long time to solve the problem with a table. Instead, write and solve an equation to find the number of payments p you will need to make.
- 3. How many payments will you make?
- Suppose you received \$75 in birthday money that you want to use towards the camp. Write and solve an equation to find the number of payments p you will

need to make.

# **Translate Sentences into Equations**

There are three steps to writing a two-step equation.

Words	Describe the situation. Use only the most important words.
Variable	Define a variable to represent the unknown quantity.
Equation	Translate your verbal model into an algebraic equation.

You know how to write verbal sentences as one-step equations.

Some verbal sentences translate into two-step equations.

# **Examples**

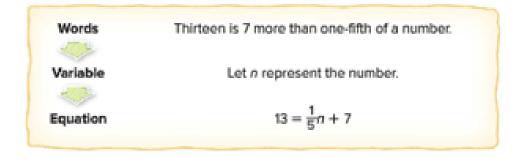


Translate each sentence into an equation.

1. Eight less than three times a number is -23.

Words	Eight less than three times a number is -23.
Variable	Let n represent the number.
Equation	3n - 8 = -23

2. Thirteen is 7 more than one-fifth of a number.



#### Got it? Do these problems to find out.

- a. Fifteen equals three more than six times a number.
- b. Ten increased by the quotient of a number and 6 is 5.
- c. The difference between 12 and  $\frac{2}{3}$  of a number is 18.

c) 
$$12-\frac{3}{5}n-18$$
 or  $-\frac{3}{5}n+12=18$ 





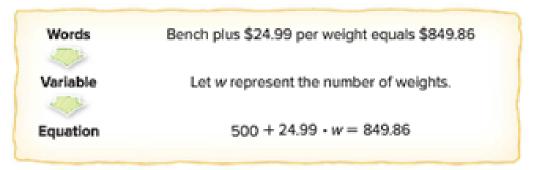
3. You buy 3 books that each cost the same amount and a magazine, all for \$55.99. You know that the magazine costs \$1.99. How much does each book cost?

Words	Three books and a magazine cost \$55.99.
Variable	Let b represent the cost of one book.
Equation	3b + 1.99 = 55.99

$$3b + 1.99 = 55.99$$
 Write the equation.
$$-1.99 = -1.99$$
 Subtraction Property of Equality
$$3b = 54.00$$
 Simplify.
$$\frac{3b}{3} = \frac{54.00}{3}$$
 Division Property of Equality
$$b = 18$$
 Simplify.

So, the books each cost \$18.

4. A personal trainer buys a weight bench for \$500 and w weights for \$24.99 each. The total cost of the purchase is \$849.86. How many weights were purchased?



$$500 + 24.99w = 849.86$$
 Write the equation.

 $-500 = -500$  Subtraction Property of Equality

 $24.99w = 349.86$  Simplify.

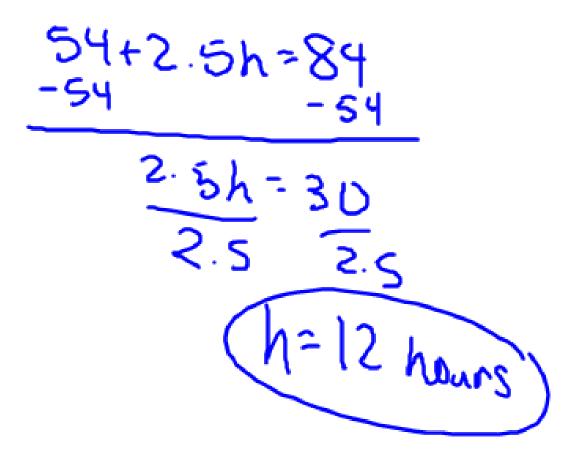
 $\frac{24.99w}{24.99} = \frac{349.86}{24.99}$  Division Property of Equality

 $w = 14$  Simplify.

So, 14 weights were purchased.

# Got it? Do this problem to find out.

d. The current temperature is 54°F. It is expected to rise 2.5°F each hour. In how many hours will the temperature be 84°F?





#### Example



5. Your and your friend's lunch cost \$19. Your lunch cost \$3 more than your friend's. How much was your friend's lunch?

Words Your friend's lunch plus your lunch equals \$19.

Variable Let f represent the cost of your friend's lunch.

Equation f+f+3=19

f + f + 3 = 19 Write the equation.

2f + 3 = 19 f + f = 2f

— 3 = — 3 Subtraction Property of Equality

2f = 16 Simplify.

 $\frac{2f}{2} = \frac{16}{2}$  Division Property of Equality

f = 8 Simplify.

Your friend spent \$8.

4(f + 3)= 19 4(f + 3)= 19

# **Guided Practice**

#### Translate each sentence into an equation. (Examples 1 and 2)

- One more than three times a number is 7.
- Seven less than one-fourth of a number is -1.
- 3. The quotient of a number and 5, less 10, is 3.
- 4. You already owe \$4.32 in overdue rental fees and are returning a movie that is 4 days late. Now you owe \$6.48. Define a variable. Then write and solve an equation to find the daily fine for an overdue movie. (Examples 3–5)

f= daily fine

4.32+47=6.48