

# VARIABLES

## Translating Sentences



### EXAMPLE

Alex is  $h$  inches tall. If Alex grows three more inches, then he will be 32 inches tall. How many inches tall is Alex today?

If Alex grows three more inches, then he will be three inches taller than he is right now.

We write “three more than  $h$ ” as  $h+3$ , so our equation is  $h+3 = 32$ .  
(We could also write  $3+h = 32$ .)

Subtracting three from both sides, we get  $h = 29$ .

So, Alex is **29** inches tall today.

### PRACTICE

Write an equation for each word problem below. Then, solve the equation.

*Many of the problems below can be solved without writing an equation.*

*However, the problems provide good practice for writing and solving equations.*

**100.** Ralph is  $r$  years old. In thirty-seven years, Ralph will be forty-four years old. How old is Ralph today?

**100.** equation: \_\_\_\_\_

$r =$  \_\_\_\_\_

**101.** Winnie made  $w$  cookies. Alex made 36 cookies. Winnie and Alex made a total of 84 cookies. How many cookies did Winnie make?

**101.** equation: \_\_\_\_\_

$w =$  \_\_\_\_\_

**102.** There are 65 adult hexatoads and  $h$  baby hexatoads in Professor Grok’s office. All together, there are 122 hexatoads in his office. How many baby hexatoads are in Grok’s office?

**102.** equation: \_\_\_\_\_

$h =$  \_\_\_\_\_

**103.** Winnie enters an elevator on floor  $f$ . She goes up 6 floors, down 4 floors, and then up 2 more floors, where she exits the elevator on floor 9. On what floor did Winnie enter the elevator?

**103.** equation: \_\_\_\_\_

$f =$  \_\_\_\_\_

**EXAMPLE**

Sam is 3 years older than Tim. The sum of Sam's and Tim's ages, in years, is 17. How many years old is Tim?

We use  $t$  to represent Tim's age, in years.

Sam is 3 years older than Tim, so Sam is  $t+3$  years old.

A "sum" is the result of addition, so Tim's age ( $t$ ) added to Sam's age ( $t+3$ ) is 17:

$$t+(t+3)=17.$$

The associative property of addition lets us remove parentheses in a sum, so the equation above is equal to

$$t+t+3=17.$$

Subtracting 3 from both sides, we get  $t+t=14$ .

Since  $7+7=14$ , the value of  $t$  is 7. Tim is 7 years old.

We check our answer: Tim is 7 years old. So, Sam is  $7+3=10$  years old. The sum of Sam's and Tim's ages is  $7+10=17$  years. ✓

**PRACTICE**

Solve each word problem below.

- 104.** Together, Grogg and Alex have 32 gumballs. Grogg has twelve more gumballs than Alex. How many gumballs does Alex have?

**104.** \_\_\_\_\_

- 105.** The sum of Olivia's and Ralph's heights is 64 inches. Olivia is 6 inches taller than Ralph. How many inches tall is Ralph?

**105.** \_\_\_\_\_

- 106.** Together, a xylophone and case cost \$100. The xylophone costs \$80 more than the case. How much does the case cost?

**106.** \_\_\_\_\_

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*Word Problems*

- 107.** Alex earned a total of \$42 working after school on Monday and Tuesday. On Tuesday, he earned six dollars more than he earned on Monday. How much did Alex earn on Monday? **107.** \_\_\_\_\_
- 108.** Fiona scored 33 points during two Beastball games. She scored nine fewer points during the first game than she scored during the second game. How many points did she score during the second game? **108.** \_\_\_\_\_
- 109.** Lizzie read a total of 61 pages on Wednesday, Thursday, and Friday. She read 7 pages more on Friday than she read on Wednesday. On Thursday, she read 6 pages fewer than she read on Wednesday. How many pages did Lizzie read on Wednesday? **109.** \_\_\_\_\_