1-4 Translating Words into Symbols

Objective: To translate phrases into variable expressions.

	Phrase	Variable Expression
Addition	The sum of 6 and x	6 + x
	A number increased by 5	n+5
	3 more than a number	n+3
Subtraction	The difference between a number and 7	x-7
	A number decreased by 6	x-6
	3 less than a number	n-3
	9 minus a number	9-n
Multiplication	The <i>product</i> of 6 and a number	6n
	Five times a number	5n
	One half of a number	$\frac{1}{2}x$
Division	The quotient of a number and 4	<u>n</u> 4
	A number divided by 8	<u>n</u> 8

CAUTION The phrase "6 less than x" is translated x - 6 and not 6 - x. The phrase "6 more than x" can be translated as either 6 + x or x + 6.

Example 1 Translate each phrase into a variable expression.

- **a.** Five less than half of x
- **b.** One half the difference between x and 5

Solution a. Half of x: $\frac{1}{2}x$ Five less than half of x: $\frac{1}{2}x - 5$

b. The difference between x and 5: (x - 5)One half the difference between x and 5: $\frac{1}{2}(x - 5)$

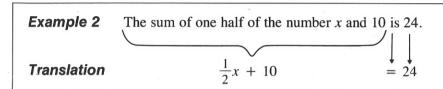
Translate each phrase into a variable expression. Use n for the variable.

- 1. Five more than a number
- 3. A number divided by 4
- 5. The sum of 3 and a number
- 7. The quotient of a number and 3
- 9. Nine times a number
- 11. Four more than half a number
- 13. Ten less than one half a number
- 15. Three plus the product of a number and 5
- 17. Four more than three times a number
- 19. Eight times the sum of a number and 2

- 2. The product of 7 and a number
- 4. Seven less than a number
- 6. A number decreased by 8
- 8. The difference between a number and 6
- 10. The difference between 9 and a number
- 12. Two less than 4 times a number
- 14. The quotient of 3 and a number
- 16. The difference between 3 times a number and 6
- 18. Nine increased by twice a number
- 20. Seven times the difference of a number and 5

1-5 Translating Sentences into Equations

Objective: To translate word sentences into equations.



Match the sentence in the first column with the corresponding equation in the second column.

- 1. Three more than twice a number is nine.
- 2. Two less than three times a number is nine.
- 3. Three times the number which is two less than x is nine.
- **4.** Two times the number which is three less than x is nine.
- 5. Two times the quantity three more than x is nine.
- **6.** Three less than the product of two and x is nine.
- 7. Two decreased by three times a number is nine.
- **8.** Three times the quantity two decreased by x is nine.

a.
$$2 - 3x = 9$$

b.
$$3(x-2)=9$$

c.
$$2x + 3 = 9$$

d.
$$2(x + 3) = 9$$

e.
$$3(2 - x) = 9$$

f.
$$2(x-3) = 9$$

g.
$$2x - 3 = 9$$

h.
$$3x - 2 = 9$$

Translate each sentence into an equation.

- 9. One half of a number is four.
- 11. Six less than a number is nine.
- **13.** Twice a number is 12 more than five times the number.
- 15. Five less than twice a number is 15.
- 17. Eleven more than twice x is five less than x.
- 10. Three more than a number is eight.
- 12. Two less than three times a number is eleven.
- **14.** The number *x* is seven more than one fourth of itself.
- **16.** Two times the quantity x minus 1 is 12.
- **18.** Nine times x is twice the sum of x and five.

Vocabulary

Formulas Equations that state rules about relationships. Examples:

$$A = lw$$

Area of rectangle = length of rectangle
$$\times$$
 width of rectangle

$$P=2l+2w$$

Perimeter of rectangle =
$$(2 \times length) + (2 \times width)$$

$$D = rt$$

Distance traveled = rate
$$\times$$
 time traveled

$$C = np$$

$$Cost = number of items \times price per item$$