

Lesson 1-3

Example 1 Evaluate Expressions

Evaluate $15 - x + y$ if $x = 9$ and $y = 11$

$$\begin{aligned}15 - x + y &= 15 - 9 + 11 \\ &= 6 + 11 \\ &= 17\end{aligned}$$

Replace x with 9 and y with 11.
Subtract 9 from 15.
Add 6 and 11.

Example 2 Evaluate Expressions

Evaluate each expression if $a = 8$, $b = 5$, and $c = 3$.

a. $4c + 3a$

$$\begin{aligned}4c + 3a &= 4(3) + 3(8) \\ &= 12 + 24 \\ &= 36\end{aligned}$$

Replace c with 3 and a with 8
Multiply.
Add 12 and 24.

b. $\frac{ab}{4}$

$$\frac{ab}{4} = ab \div 4$$

$$\begin{aligned}&= (8 \cdot 5) \div 4 \\ &= 40 \div 4 \\ &= 10\end{aligned}$$

Rewrite as a division expression.

Replace a with 8 and b with 5.
Multiply 8 and 5.
Divide 40 by 4.

c. $9a - (6c + 2b) - 14$

$$\begin{aligned}9a - (6c + 2b) - 14 &= 9(8) - (6 \cdot 3 + 2 \cdot 5) - 14 \\ &= 9(8) - (18 + 10) - 14 \\ &= 9(8) - 28 - 14 \\ &= 72 - 28 - 14 \\ &= 44 - 14 \\ &= 30\end{aligned}$$

Replace a with 8, c with 3, and b with 5.
Multiply 6 and 3 and 2 and 5.
Add 18 and 10.
Multiply 9 and 8.
Subtract 28 from 72.
Subtract 14 from 44.

Example 3 Translate Verbal Phrases

Translate each phrase into an algebraic expression.

a. eight degrees less than yesterday's temperature

Words eight degrees less than yesterday's temperature

Variable Let t represent yesterday's temperature.

Expression $t - 8$

Eight degrees less than yesterday's temperature is represented by $t - 8$.

b. three more than six times a number

Words three more than six times a number
Variable Let n represent the number.
Expression three more than six times a number

$$3 \quad + \quad 6n$$

Three more than six times a number is represented by $3 + 6n$.

Example 4 Use Expressions to Solve Problems

CANDY **The Sweet Tooth Candy Shop sells fudge for \$4 per pound and licorice for \$3 per pound.**

a. Write an expression that can be used to find the total cost of a purchase of fudge and licorice.

Words \$4 per pound of fudge and \$3 per pound of licorice
Variables Let f = pounds of fudge and λ = pounds of licorice.
Expression \$4 per pound of fudge and \$3 per pound of licorice

$$4f \quad + \quad 3\lambda$$

The expression $4f + 3\lambda$ can be used to find the total cost of a purchase of fudge and licorice.

b. Suppose Emily goes to The Sweet Tooth Candy Shop and purchase 2 pounds of fudge and 4 pounds of licorice. What was the total cost of her purchase?

$$\begin{aligned} 4f + 3\lambda &= 4(2) + 3(4) && \text{Replace } f \text{ with 2 and } \lambda \text{ with 4.} \\ &= 8 + 12 && \text{Multiply} \\ &= 20 && \text{Add} \end{aligned}$$

Emily spent \$20.