7-1 The Distributive Property

Use the Distributive Property to write each expression as an equivalent algebraic expression.

18. $-7.4(10 + a)$

SOLUTION:

$$\begin{aligned} -7.4(10+a) &= -7.4 \bullet 10 + (-7.4)a \\ &= -74 - 7.4a \end{aligned}$$

ANSWER:

$-74 - 7.4a$

20. $3.7(r - 1)$

SOLUTION:

$$\begin{aligned} 3.7(r-1) &= 3.7\left[r + (-1)\right] \\ &= 3.7 \bullet r + 3.7 \bullet (-1) \\ &= 3.7r + (-3.7) \\ &= 3.7r - 3.7 \end{aligned}$$

ANSWER:

$3.7r - 3.7$

36. Admission to Hersheypark Theme Park in Hershey, Pennsylvania, is \$52.95 for an adult and \$31.95 for children. The Diego family has a coupon for \$10 off each admission ticket. Write an expression to find the cost for x adults and y children.

SOLUTION:

With the coupon, the admission price for an adult is (\$52.95 – \$10) and the admission price for a child is (\$31.95 – \$10). The total admission cost for x adults and y children can be expressed as x(\$52.95 – \$10) + y(\$31.95 – \$10).

ANSWER:

x(\$52.95 – \$10) + y(\$31.95 – \$10)

7-2 Simplifying Algebraic Expressions

Identify the terms, like terms, coefficients, and constants in each expression.

18. $7j + 11jk + k + 9$

SOLUTION:

Terms are the parts of algebraic expressions that are separated by addition or subtraction signs. Like terms are terms that contain the same variables. Coefficients are the numerical part of a term that contains a variable, and constants are terms without variables. So, in the expression $7j + 11jk + k + 9$ the terms are $7j$, $11jk$, k, 9; there no like terms; the coefficients are 7, 11, 1; and the constant is 9.

ANSWER:

terms: $7j$, $11jk$, k, 9; like terms: none; coefficients: 7, 11, 1; constant: 9

Simplify each expression.

28. $-x - 2y - 8x - 2y$

SOLUTION:

$$\begin{aligned} -x-2y-8x-2y &= -x+(-2y)+(-8x)+(-2y) \\ &= -x+(-8x)+(-2y)+(-2y) \\ &= [-1+(-8)]x+[-2+(-2)]y \\ &= -9x+(-4)y \\ &= -9x-4y \end{aligned}$$

ANSWER:

$-9x - 4y$

For each situation, write an expression in simplest form that represents the total amount.

34. You used p minutes one month on your cell phone. The next month you used 75 fewer minutes.

SOLUTION:

total minutes = minutes used in one month + minutes used in the next month

Let p = minutes used in one month.

Let $p - 75$ = minutes used in the next month.

$$\begin{aligned} p+p-75 &= p+p+(-75) \\ &= (1+1)p+(-75) \\ &= 2p+(-75) \\ &= 2p-75 \end{aligned}$$

So, the expression $2p - 75$ represents the total number of minutes used in two months.

ANSWER:

$2p - 75$

7-3 Adding Linear Expressions

Add. Use models if needed.

10. $(-2x + 1) + (2x + 10)$

SOLUTION:

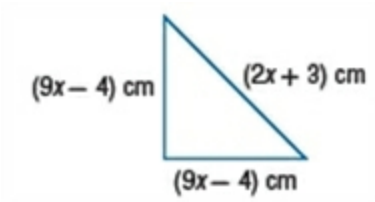
$$\begin{aligned}(-2x+1)+(2x+10) &= -2x+1+2x+10\\ &= (-2x+2x)+(1+10)\\ &= 0+11\\ &= 11\end{aligned}$$

ANSWER:

11

For each of the figures, write and simplify a linear expression for the perimeter of the figure. Then find the perimeter of each figure if x = 0.8.

12.



SOLUTION:

The perimeter is the sum of all of the sides.

$$\begin{aligned}P &= (9x-4)+(2x+3)+(9x-4)\\ &= 9x-4+2x+3+9x-4\\ &= 9x+2x+9x-4+3-4\\ &= 11x+9x-1-4\\ &= 20x-5\end{aligned}$$

Substitute 0.8 for x in the equation $P = 20x - 5$.

$$\begin{aligned}P &= 20x-5\\ &= 20(0.8)-5\\ &= 11\end{aligned}$$

The perimeter of the figure is 11 centimeters.

ANSWER:

$20x - 5$; 11 cm

14. The angle measures of a triangle are $(x + 15)°$, $(2x – 20)°$, and $2x°$. What are the actual angle measures of the triangle?

SOLUTION:

The sum of the angles of a triangle is 180.

$$\begin{aligned}(x+15)+(2x-20)+2x&=180\\ x+15+2x-20+2x&=180\\ x+2x+2x+15-20&=180\\ 5x-5&=180\\ 5x-5+5&=180+5\\ 5x&=185\\ \frac{5x}{5}&=\frac{185}{5}\\ x&=37\end{aligned}$$

The value of x is 37. So, the three angle measures are 37 + 15 or 52°, 2(37) – 20 or 54°, and 2(37) or 74°.

ANSWER:

52°, 54°, and 74°