Practice 1.1.2: Interpreting Complicated Expressions

Use your understanding of terms, coefficients, factors, exponents, and the order of operations to answer each of the following questions.

1. Is the expression $\frac{5+3x}{2}$ equal to the expression $4x$? Explain your answer.

2. Is the expression $2 \cdot 4^x$ equal to the expression 8^x? Explain your answer.

3. Is the expression $(5 \cdot 2)^x$ equal to the expression 10^x? Explain your answer.

4. A transfer station charges \$15 for a waste disposal permit and an additional \$5 for each cubic yard of garbage it disposes of. This relationship can be described using the expression $15 + 5x$. What effect, if any, does changing the value of x have on the cost of the permit?

5. Absolute Cable company bills on a monthly basis. Each bill includes a \$30.00 service fee plus \$4.75 in taxes and \$2.99 for each movie purchased. The following expression describes the cost of the cable service per month: $34.75 + 2.99m$. If Absolute Cable lowers the service fee, how will the expression change?

continued

6. In order to lose weight in a healthy manner, a veterinarian suggested an overweight large-breed dog lose no more than 2 pounds per week. If the expression $x - 2y$ represents this situation, what must be true about the value of y?

7. The product of 7, x, and y is represented by the expression $7xy$. If the value of x is negative, what can be said about the value of y in order for the product to remain positive?

8. A bank account balance for an account with an initial deposit of P dollars earns interest at an annual rate of r. The amount of money in the account after n years is described using the following expression: $P(1 + r)^n$. What effect, if any, does decreasing the value of r have on the amount of money after n years?

9. For what values of x will the result of 5^x be greater than 1?

10. A tire can hold C cubic feet of air. It loses air at a rate of r for a period of time, t. This situation can be described using the following formula: $C(1 - r)^t$. What effect, if any, does increasing the value of r have on the value C?