Instruction

Guided Practice 1.1.2

Example 1

A new car loses an average value of $1,800 per year for each of the first six years of ownership. When Nia bought her new car, she paid $25,000. The expression 25,000 – 1800y represents the current value of the car, where y represents the number of years since Nia bought it. What effect, if any, does the change in the number of years since Nia bought the car have on the original price of the car?

1. Refer to the expression given: 25,000 – 1800y.

   The term 1800y represents the amount of value the car loses each year, y. As y increases, the product of 1800 and y also increases.

2. 25,000 represents the price of the new car.

   As y increases and the product of 1800 and y increases, the original cost is not affected. 25,000 is a constant and remains unchanged. ✓

Example 2

To calculate the perimeter of an isosceles triangle, the expression $2s + b$ is used, where s represents the length of the two congruent sides and b represents the length of the base. What effect, if any, does increasing the length of the congruent sides have on the expression?

1. Refer to the expression given: $2s + b$.

   Changing only the length of the congruent sides, s, will not impact the length of base b since b is a separate term.

2. If the value of the congruent sides, s, is increased, the product of $2s$ will also increase. Likewise, if the value of s is decreased, the value of $2s$ will also decrease.

3. If the value of s is changed, the result of the change in the terms is a doubling of the change in s while the value of b remains the same. ✓

Instruction

Example 3

Money deposited in a bank account earns interest on the initial amount deposited as well as any interest earned as time passes. This compound interest can be described by the expression $P(1 + r)^n$, where P represents the initial amount deposited, r represents the interest rate, and n represents the number of months that pass. How does a change in each variable affect the value of the expression?

1. Refer to the given expression: $P(1 + r)^n$.

   Notice the expression is made up of one term containing the factors P and $(1 + r)^n$.

2. Changing the value of P does not change the value of the factor $(1 + r)^n$, but it will change the value of the expression by a factor of P. In other words, the change in P will multiply by the result of $(1 + r)^n$.

3. Similarly, changing r changes the **base** of the exponent (the number that will be multiplied by itself), but does not change the value of P. This change will affect the value of the overall expression.

4. Changing n changes the number of times $(1 + r)$ will be multiplied by itself, but does not change the value of P. This change will affect the value of the overall expression.