More Expressions and Equations

Let's solve harder problems by writing equivalent expressions.

8.1 Tickets for the School Play

Student tickets for the school play cost $2 less than adult tickets.

1. If a represents the price of 1 adult ticket, write an expression for the price of 1 student ticket.

2. Write an expression that represents the amount of money they collected each night:
   a. The first night, the school sold 60 adult tickets and 94 student tickets.

   b. The second night, the school sold 83 adult tickets and 127 student tickets.

3. Write an expression that represents the total amount of money collected from ticket sales on both nights.

4. Over these two nights, they collected a total of $1,651 in ticket sales.
   a. Write an equation that represents this situation.

   b. What was the cost of each type of ticket?

5. Is your solution reasonable? Explain how you know.

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8.2 A Souvenir Stand

The souvenir stand sells hats, postcards, and magnets. They have twice as many postcards as hats, and 100 more magnets than postcards.

1. Let h represent the total number of hats. Write an expression in terms of h for the total number of items they have to sell.

2. The owner of the stand pays $8 for each hat, $0.10 for each postcard, and $0.50 for each magnet. Write an expression for the total cost of the items.

3. The souvenir stand sells the hats for $11.75 each, the postcards for $0.25 each, and the magnets for $3.50 each. Write an expression for the total amount of money they would take in if they sold all the items.

4. Profits are calculated by subtracting costs from income. Write an expression for the profits of the souvenir stand if they sell all the items they have. Use properties to write an equivalent expression with fewer terms.

5. The souvenir stand sells all these items and makes a total profit of $953.25.

   a. Write an equation that represents this situation.

   b. How many of each item does the souvenir stand sell? Explain or show your reasoning.

8.3 Jada Crochets a Scarf

Basic crochet stitches are called single, double, and triple. Jada measures her average stitch size and sees that a "double crochet" stitch is not really twice as long as a single crochet stitch. It uses $\frac{1}{2}$ inch less than twice as much yarn as a single crochet stitch. Jada's "triple crochet" stitch uses 1 inch less than three times as much yarn as a single crochet stitch.

1. Write an expression that represents the amount of yarn Jada needs to crochet a scarf that includes 800 single crochet stitches, 400 double crochet stitches, and 200 triple crochet stitches.

2. Write an equivalent expression with as few terms as possible.

3. If Jada uses 5540 inches of yarn for the entire scarf, what length of yarn does she use for a single crochet stitch?