Problem Solving

Solving Linear Inequalities

Write the correct answer.

1. Shania would like to give $5 gift cards and $4 teddy bears as party favors. Sixteen people have been invited to the party. Shania has $100 to spend on party favors. Write and graph an inequality to find the number of gift cards \( x \) and teddy bears \( y \) Shania could purchase.

2. Hank has 20 yards of lumber that he can use to build a raised garden. Write and graph a linear inequality that describes the possible lengths and widths of the garden. If Hank wants the dimensions to be whole numbers only, what dimensions would produce the largest area?

3. The royalties for the high school play are $250. Tickets to the play cost $5 for students and $8 for nonstudents. What linear inequality describes the number of student and nonstudent tickets that need to be sold so that the drama class can pay the royalties?
   A \( 5x + 8y \geq 250 \)
   B \( 5x + 8y > 250 \)
   C \( 5xy + 8 < 250 \)
   D \( 5xy + 8 \geq 250 \)

4. The inequality \( x + y \leq 8 \) describes the amounts of two juices Annette combines to make a smoothie. Which is a solution to the inequality?
   F \((3, 6)\)
   H \((7, 2)\)
   G \((6, 1)\)
   J \((0, 10)\)

5. A baker is making chocolate and lemon pound cakes. He can make at most 12 cakes at one time. Which inequality describes the situation?
   A \( x + y > 12 \)
   B \( x + y \geq 12 \)
   C \( x + y \leq 12 \)
   D \( x + y < 12 \)

6. Erasmus is the master gardener for a university. He wants to plant a mixture of purple and yellow pansies at the west entrance to the campus. From past experience, Erasmus knows that fewer than 350 pansies will fit in the planting area. Which inequality describes the situation?
   F \( x + y \leq 350 \)
   H \( x + y \leq 350 \)
   G \( x + y > 350 \)
   J \( x + y < 350 \)
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\[ 5x + 4y \leq 100 \]

2. Hank has 20 yards of lumber that he can use to build a raised garden. Write and graph a linear inequality that describes the possible lengths and widths of the garden. If Hank wants the dimensions to be whole numbers only, what dimensions would produce the largest area?

\[ 2x + 2y \leq 20; \text{ 5 yd by 5 yd} \]

3. The royalties for the high school play are $250. Tickets to the play cost $5 for students and $8 for nonstudents. What linear inequality describes the number of student and nonstudent tickets that need to be sold so that the drama class can pay the royalties?

\( \begin{align*}
\text{A} & \quad 5x + 8y \geq 250 \\
\text{B} & \quad 5x + 8y > 250 \\
\text{C} & \quad 5x + 8y < 250 \\
\text{D} & \quad 5x + 8y = 250
\end{align*} \)

4. The inequality \( x + y \leq 8 \) describes the amounts of two juices Annette combines to make a smoothie. Which is a solution to the inequality?

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\text{F} & \quad (3, 6) \\
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6. Erasmus is the master gardener for a university. He wants to plant a mixture of purple and yellow pansies at the west entrance to the campus. From past experience, Erasmus knows that fewer than 350 pansies will fit in the planting area. Which inequality describes the situation?

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