Expressions and Equations Unit Test Review

1. Evaluate the following for \( a = 7 \) and \( b = 9 \). Show all steps to receive full credit.
   
   \[
   a^2 + b^2 \quad 12b - 2a \quad (b + 4a) \times 3
   \]

2. At the beginning of her mathematics class, Ms. Lordi gives a warm-up question.

   “I am thinking of a number that when it’s divided by 8 it equals 12”

   • Write an equation to represent the problem.

   • Solve and check the equation.

3. Insert \( \neq \) or \( = \) to complete the number sentences below.

   \[
   3x \quad \_\_\_ \quad x + x + x \quad 5(n + 9) \quad \_\_\_ \quad 5n + 9 \quad 3x \quad \_\_\_ \quad x^3
   \]
4. Ben decides to start a business walking dogs and cleaning swimming pools. It takes him 15 minutes to walk one dog and 20 minutes to use a skimmer and clean one swimming pool.

- Write an expression to show how long it would take Ben to walk some dogs and clean some swimming pools. Be sure to explain what your variables mean.

- Evaluate your expression to see how long it would take Ben to walk 6 dogs and clean 8 swimming pools. Be sure to show all steps to receive full credit.

5. Chase and Amanda each simplified the following expressions.

- Simplify both the expressions and tell which student simplified their expression correctly.
- Then, find and explain the mistake in the other student’s work.

<table>
<thead>
<tr>
<th>Chase</th>
<th>Amanda</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 – 2 × 6 + 3</td>
<td>36 ÷ 6 × 2 + 8</td>
</tr>
<tr>
<td>14 – 12 + 3</td>
<td>36 ÷ 12 + 8</td>
</tr>
<tr>
<td>2 + 3</td>
<td>3 + 8</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
</tr>
</tbody>
</table>
6. Translate the following verbal phrases:

   a. Four times a number is ninety-six. ________________________________

   b. The quotient of a number and five is three.________________________

   c. The difference between a number and eighteen is twenty. ________________

7. Solve the following equations. Show all steps to receive full credit.

\[
6x = 96 \quad a + 23 = 72 \quad \frac{x}{7} = 14
\]

8. Simplify the following expressions:

\[(8 + 42 - 2) ÷ 12 + 6^2 \quad (13 + 52 - 5^2) ÷ (15-7)\]
9.  a. Mrs. Pike is planning a surprise party. She needs at least 25 party favors for her guests. Let $p$ represent the number of party favors she purchases. Write an inequality to represent the problem.

\[
p \geq 25
\]

b. Sally wants to order books over the internet. Each book costs $10 and the shipping for the entire order is $5. Sally has no more than $60 to spend. Write an inequality to represent the problem. Don’t forget to define your variable.

\[
10p + 5 \leq 60
\]

c. Circle the number that could not replace the value of $g$. 5.5, 7, 8

\[
6g \leq 42
\]

10. A roller-blade supply store rents roller blades for $2.50 per skater.
   a. Using increments of 5 skaters, make a table showing the total rental charge for 0 to 50 skaters.

<table>
<thead>
<tr>
<th>Skaters</th>
<th>Rental Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>12.50</td>
</tr>
<tr>
<td>10</td>
<td>25.00</td>
</tr>
<tr>
<td>15</td>
<td>37.50</td>
</tr>
<tr>
<td>20</td>
<td>50.00</td>
</tr>
<tr>
<td>25</td>
<td>62.50</td>
</tr>
<tr>
<td>30</td>
<td>75.00</td>
</tr>
<tr>
<td>35</td>
<td>87.50</td>
</tr>
<tr>
<td>40</td>
<td>100.00</td>
</tr>
<tr>
<td>45</td>
<td>112.50</td>
</tr>
<tr>
<td>50</td>
<td>125.00</td>
</tr>
</tbody>
</table>

b. On separate graph paper, make a coordinate graph of the data.

c. Identify the independent and dependent variable.

d. Does it make sense to connect the points on your coordinate graph? Why or why not?