1. Assuming that the pattern continues, what are the next 3 terms?  
39, 34, 29, ___, ___, ___  
A 14, 19, 24  
B 24, 19, 14  
C 28, 24, 20  
D 29, 24, 19  

2. Assuming that the pattern continues, how many small triangles are in the fourth design?  

![Triangle Patterns]  
A 10  
B 15  
C 25  
D 30  

3. There are 8 people at a business meeting. Everyone shakes hands with everyone else once. How many handshakes would there be?  
A 28  
B 24  
C 21  
D 8  

4. Assuming that the pattern continues, what are the next 3 terms?  
15, 18, 21, 24, ___, ___, ___  
A 33, 30, 27  
B 31, 30, 27  
C 27, 30, 33  
D 27, 31, 34  

5. Use the pattern of designs below. What is the total number of rectangles at each step in the pattern?  

![Rectangles Pattern]  
A 1, 2, 3, 4  
B 1, 2, 4, 8  
C 1, 3, 5, 7  
D 1, 3, 6, 10  

6. Which of the following rules describes the number pattern? 5, 10, 20, 40  
A Start with 5 and multiply by 2 repeatedly  
B Start with 5 and add 10 repeatedly  
C Start with 5 and add 2 repeatedly  
D Start with 5 and multiply by 5 repeatedly  

7. A pattern is created by starting with 2 and adding 3.5 repeatedly. Which is the first 5 terms of this pattern?  
A 2, 3.5, 5.5, 9, 12.5  
B 2, 5.5, 9, 12.5, 16  
C 3.5, 7, 10.5, 14, 17.5  
D 5.5, 9, 12.5, 16, 18  

8. Which of the following rules describes the number pattern? 0.57, 0.48, 0.39, 0.30, ___, ___, ___  
A subtract 0.9 from each term  
B add 0.9 from each term  
C subtract 0.7 from each term  
D add 0.7 from each term  

(appendix continues)
9. Bamboo, which is a grass, grows as much as 3 ft high per day.

<table>
<thead>
<tr>
<th>Number of days</th>
<th>1</th>
<th>4</th>
<th>8</th>
<th>12</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of plants</td>
<td>3</td>
<td>12</td>
<td>24</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>

What will be the height of the bamboo at 16 days?

A 36
B 42
C 48
D 56

10. Five bacteria are placed in a petri dish then counted each hour. The first bacteria counts were: 12, 26, 54, 110. As this pattern continues, how many hours later will there be 446 bacteria?

A 6 hours
B 7 hours
C 8 hours
D 10 hours

11. Assuming that the design continues, how many triangles are there on the 6th row?

A 5
B 6
C 11
D 13

12. Using the table below, what is the total number of squares for a 5 x 5 grid?

<table>
<thead>
<tr>
<th>Size of Grid</th>
<th>1x1</th>
<th>2x2</th>
<th>3x3</th>
<th>4x4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 x 2</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>3 x 3</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>4 x 4</td>
<td>16</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>30</td>
</tr>
</tbody>
</table>

A 25
B 30
C 50
D 55

13. If [ ] represents x and [ ] represents 1 unit, which example below models the variable expression 5x + 3?

A
B
C
D

14. Which of the following variable expressions represents the model below?

A 2x + 4
B 2x + 3
C 4x + 2
D 4x + 3

(appendix continues)
15. The total weight of the balance is 16. What is the value of each shape in the figure below?

- A circle = 8
- A triangle = 8

16. Multiply each entry in the figure below by 3 and then add 5

\[
\begin{array}{ccc}
1 & 5 & 4 \\
2 & & \\
3 & & \\
\end{array}
\]

Which is the resulting figure?

- A

\[
\begin{array}{ccc}
8 & 28 & 23 \\
13 & & \\
18 & & \\
\end{array}
\]

- B

\[
\begin{array}{ccc}
3 & 15 & 12 \\
6 & & \\
9 & & \\
\end{array}
\]

- C

\[
\begin{array}{ccc}
8 & 20 & 17 \\
11 & & \\
14 & & \\
\end{array}
\]

- D

\[
\begin{array}{ccc}
6 & 11 & 9 \\
7 & & \\
8 & & \\
\end{array}
\]

17. Which numerical expression below has a value closest to 60?

- A \( 38 + 4 \cdot 5 \)
- B \( 3 \cdot 4 + 6 \cdot 2 \)
- C \( 4 + 11 \cdot 4 \)
- D \( 5^2 + 4 \cdot 2 \)

18. Use the graph below. Which best describes the function?

- A output = 4 \( \bullet \) input + 1
- B output = 3 \( \bullet \) input + 2
- C output = 2 \( \bullet \) input + 3
- D output = 1 \( \bullet \) input + 4

(appendix continues)
19. Three vertices of a rectangle have coordinates (-1,2), (5,2), and (-1,4). Which is the coordinate of the fourth vertex?

A (5, -4)  
B (-4, 5)  
C (5, 4)  
D (4, -5)

20. The drama club sells carnations for its Annual holiday fund-raiser. Help the drama club decide which company to use. Which graph below represents the company that would be the most economical for the club to hire?

Note. From Math Pretest and Posttest, by S. H. Lapinski, 1999, Henrico County Public Schools. Adapted with permission.