1. The total cost for an extra large pizza at a restaurant is $14.50, plus $1.25 for each topping.

Which of the following equations represents the relationship between the total cost, C, in dollars, and the number of toppings, n?

- C = 1.25n
- C = 15.75n
- C = 1.25n + 14.50
- C = 14.50n + 1.25

m = 1.25
b = 14.50

C = 1.25n + 14.50
y = 1.25x + 14.50

3. What are the slope and the y-intercept of the line represented by 3x - 2y + 6 = 0?

- \( m = \frac{3}{2}, b = 3 \)
- \( m = \frac{3}{2}, b = 3 \)
- \( m = \frac{3}{2}, b = 3 \)
- \( m = \frac{3}{2}, b = 3 \)

4. Consider the graph below.

Which of the following is an equation representing this graph?

- P = 2n + 6
- P = \( \frac{1}{2} n + 6 \)
- P = -2n + 6
- P = -\( \frac{1}{5} n + 6 \)
6. Information about four different linear relationships between \( C \) and \( n \) is shown below.

<table>
<thead>
<tr>
<th>( n )</th>
<th>( C )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>90</td>
</tr>
<tr>
<td>12</td>
<td>35</td>
</tr>
<tr>
<td>14</td>
<td>40</td>
</tr>
</tbody>
</table>

How many of the linear relationships have a rate of change of 5?

- 4
- 3
- 2
- 1

7. What is an equation of the line
   - perpendicular to the line represented by \( y = -\frac{1}{2}x + 1 \) and
   - with the same y-intercept as the line represented by \( y = 7 + 5x \)?

\[ a) y = \frac{2}{3}x + 7 \]
\[ b) y = \frac{2}{3}x + 5 \]
\[ c) y = -\frac{2}{3}x + 7 \]
\[ d) y = -\frac{2}{3}x + 5 \]

\[ \text{How many of the linear relationships have a rate of change of 5?} \]

8. Which of the following shows information from a linear relation between \( C \) and \( n \)?

\[ \text{a)} \]
\[ \begin{array}{c|c|c}
\hline
n & X & Y \\
\hline
0 & 0 & 0 \\
1 & 1 & 1 \\
2 & 3 & 2 \\
3 & 5 & 1 \\
4 & 7 & 2 \\
\hline
\end{array} \]

\[ \text{b)} \]
\[ \begin{array}{c|c|c}
\hline
n & X & Y \\
\hline
0 & 0 & 4 \\
1 & 1 & 5 \\
2 & 2 & 2 \\
3 & 3 & 4 \\
\hline
\end{array} \]

\[ \text{c)} \]
\[ \begin{array}{c|c|c}
\hline
n & X & Y \\
\hline
0 & 0 & 5 \\
1 & 1 & 6 \\
2 & 2 & 7 \\
3 & 3 & 8 \\
\hline
\end{array} \]

9. The total cost of yearbooks for a school is made up of a \$375 set-up fee and \$25 for each yearbook purchased.

There is a linear relationship between the total cost and the number of yearbooks purchased.

What type of variation is this relationship, and what is its initial value?

- \text{a)} direct variation, \$375
- \text{b)} direct variation, \$25
- \text{c)} partial variation, \$375
- \text{d)} partial variation, \$25

\[ C = \text{cost} \]
\[ n = \# \text{ of yearbooks} \]

\[ C = 25n + 375 \]
QAO Sample Questions for Linear Relations – Part 1:

1. Two companies sell fabric online. The total cost, $C$, in dollars, for $n$ metres of fabric for each company is given below.

   • Fabric Fun: $C = 4.25n + 3.00 \rightarrow y = 4.25x + 3.00$ (partial)
   • Sew-a-Lot: $C = 6.50n \rightarrow y = 6.50x$ (direct)

Complete the chart below by determining the initial value, rate of change and type of variation for the relationship for each company.

Justify the type of variation you have selected.

<table>
<thead>
<tr>
<th></th>
<th>Fabric Fun</th>
<th>Sew-a-Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial value</strong></td>
<td>3.00</td>
<td>0</td>
</tr>
<tr>
<td><strong>Rate of change</strong></td>
<td>4.25</td>
<td>6.50</td>
</tr>
<tr>
<td><strong>Type of variation</strong></td>
<td>Partial</td>
<td>Direct</td>
</tr>
<tr>
<td>Justification</td>
<td># of year</td>
<td>Cost ($)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>7.25</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>11.50</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15.75</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>passes through (0,0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial value</td>
<td>0</td>
<td>6.50</td>
</tr>
<tr>
<td>Rate of change</td>
<td>6.50</td>
<td></td>
</tr>
<tr>
<td>Type of variation</td>
<td>Partial</td>
<td>Direct</td>
</tr>
<tr>
<td>Justification</td>
<td># of year</td>
<td>Cost ($)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>6.50</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>13.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>19.50</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>26.00</td>
<td></td>
</tr>
<tr>
<td>passes through (0,0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C = 4.25(0) + 3.00
C = 3.00
C = 4.25(1) + 3.00
C = 7.25
C = 6.50(0)
C = 0
C = 6.50(1)
C = 6.50
2. A piece of paper is folded in half, which results in two layers of paper. Then the paper is folded in half again to make four layers, and so on.

The number of layers and the number of folds are recorded in the chart.

<table>
<thead>
<tr>
<th>Number of folds</th>
<th>Number of layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
</tr>
</tbody>
</table>

Determine whether this relationship is linear or non-linear.
Circle one:  Linear  Non-linear
Justify your answer.
You have the option of using the grid if you wish.