25 If \( g(x) = -4x^2 - 3x + 2 \), determine \( g(-2) \).

\[
\begin{array}{c|c}
 x & y \\
-3 & -25 \\
-2 & -8 \\
-1 & 1 \\
0 & 2 \\
1 & -5 \\
2 & -20 \\
3 & -43 \\
\end{array}
\]

Score 2: The student gave a complete and correct response.
Question 25

25 If \( g(x) = -4x^2 - 3x + 2 \), determine \( g(-2) \).

\[ g(-2)^2 - 3(-2) + 2 = -8 \]

Score 2:  The student gave a complete and correct response.
25 If \( g(x) = -4x^2 - 3x + 2 \), determine \( g(-2) \).

\[
\begin{align*}
g(-2) &= -4(-2)^2 - 3(-2) + 2 \\
g(-2) &= 8^2 - 3(-2) + 2 \\
g(-2) &= 64 + 6 + 2 \\
g(-2) &= 64 + 8 \\
g(-2) &= 72
\end{align*}
\]

**Score 1:** The student made an error when simplifying \(-4(-2)^2\).
If $g(x) = -4x^2 - 3x + 2$, determine $g(-2)$.

$$-4 (-2)^2 - 3 (-2) + 2$$

$$-8^2 - 3 (-2) + 2$$

$$-64 - 6 + 2$$

$$-68$$

**Score 0:** The student made more than one computational error.
25 If \( g(x) = -4x^2 - 3x + 2 \), determine \( g(-2) \).

\[ y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \]

\[ y = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(-4)(2)}}{2(-4)} \]

\[ y = \frac{3 \pm \sqrt{41}}{-8} \quad y = \frac{3 + \sqrt{41}}{-8} \quad y = \frac{3 - \sqrt{41}}{-8} \]

\[ y = -1.2 \quad y = .43 \]

**Score 0:** The student gave a completely irrelevant response.
Question 26

26 A student is in the process of solving an equation. The original equation and the first step are shown below:

Original: \(3a + 6 = 2 - 5a + 7\)
Step one: \(3a + 6 = 2 + 7 - 5a\)

Which property did the student use for the first step? Explain why this property is correct.

Commutative property of addition -
because they just switched the two numbers (-5a and 7) which is ok

Score 2: The student gave a complete and correct response.
Question 26

26 A student is in the process of solving an equation. The original equation and the first step are shown below.

Original: \( 3a + 6 = 2 - 5a + 7 \)
Step one: \( 3a + 6 = 2 + 7 - 5a \)

Which property did the student use for the first step? Explain why this property is correct.

The student chose Commutative property.

Score 1: The student did not give an explanation.
Question 26

26 A student is in the process of solving an equation. The original equation and the first step are shown below:

Original: \(3a + 6 = 2 - 5a + 7\)
Step one: \(3a + 6 = 2 + 7 - 5a\)

Which property did the student use for the first step? Explain why this property is correct.

The student used commutative property. You can move part of the equation.

Score 1: The student gave an incorrect explanation.
26 A student is in the process of solving an equation. The original equation and the first step are shown below.

- Original: \(3a + 6 = 2 - 5a + 7\)
- Step one: \(3a + 6 = 2 + 7 - 5a\)

Which property did the student use for the first step? Explain why this property is correct.

The student used the additive property, they just switched things around.

Score 0: The student gave a completely incorrect response.
27 On the set of axes below, graph the line whose equation is \(2y = -3x - 2\).

This linear equation contains the point \((2, k)\). State the value of \(k\).

Score 2: The student gave a complete and correct response.
27 On the set of axes below, graph the line whose equation is \( 2y = -3x - 2 \).

\[
\begin{align*}
2y &= -3x - 2 \\
y &= \frac{-3}{2}x - 1
\end{align*}
\]

This linear equation contains the point \((2, k)\). State the value of \(k\).

\[
\begin{align*}
(2, k) & \quad k = -4 \\
2(-4) &= -3(2) - 2 \\
-8 &= -8
\end{align*}
\]

**Score 2:** The student gave a complete and correct response.
27 On the set of axes below, graph the line whose equation is $2y = -3x - 2$.

This linear equation contains the point $(2, k)$. State the value of $k$.

\[
\begin{align*}
2y &= -3x - 2 \\
2k &= -6 - 2
\end{align*}
\]

\[
\begin{align*}
2k &= -8 \\
k &= -4
\end{align*}
\]

Score 1: The student did not graph the equation.
Question 27

On the set of axes below, graph the line whose equation is 

\[ 2y = -3x - \frac{2}{2} \]

\[ y = -1.5x - 1 \]

This linear equation contains the point \((2, k)\). State the value of \(k\).

\[ k = -4 \]

Score 1: The student made a graphing error by not having an arrow at the end or using the full display of the given set of axes.
27 On the set of axes below, graph the line whose equation is \( \frac{2y}{3} = -3x - 2 \).

This linear equation contains the point (2, k). State the value of k.

Score 0: The student graphed the line incorrectly and showed no work to find \(-4\).
The formula $a = \frac{v_f - v_i}{t}$ is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, $v_f$, in terms of initial velocity, $v_i$, acceleration, $a$, and time, $t$.

\[
\begin{align*}
    \frac{a \cdot t}{t} &= \frac{(v_f - v_i)}{t} + v_i \\
    v_f &= a \cdot t + v_i
\end{align*}
\]

**Score 2:** The student gave a complete and correct response.
Question 28

28 The formula \( a = \frac{v_f - v_i}{t} \) is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, \( v_f \), in terms of initial velocity, \( v_i \), acceleration, \( a \), and time, \( t \).

\[
\begin{align*}
\text{(a)} & \quad a = \frac{v_f - v_i}{t} \\
\text{(b)} & \quad t = \frac{v_f - v_i}{a} \\
\text{(c)} & \quad v_f = v_i + ta
\end{align*}
\]

Score 2: The student gave a complete and correct response.
The formula $a = \frac{v_f - v_i}{t}$ is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, $v_f$, in terms of initial velocity, $v_i$, acceleration, $a$, and time, $t$.

\[
a = \frac{v_f - v_i}{t}
\]

\[
\Rightarrow a = \frac{v_f - v_i}{t} \\
\Rightarrow a = \frac{v_f - v_i}{t} \\
\Rightarrow t = \frac{v_f - v_i}{a}
\]

**Score 1:** The student solved the equation for $t$ instead of $v_f$. 
Question 28

The formula $a = \frac{v_f - v_i}{t}$ is used to calculate acceleration as the change in velocity over the period of time.

Solve the formula for the final velocity, $v_f$, in terms of initial velocity, $v_i$, acceleration, $a$, and time, $t$.

$$a = \frac{v_f - v_i}{t}$$

$$a \cdot \overline{t} = \frac{v_f - v_i}{v_i}$$

$$\frac{a \cdot \overline{t}}{v_i} = v_f$$

Score 0: The student made more than one error.
Question 29

Score 2: The student gave a complete and correct response.
Question 29

29 Solve $\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$ for $x$.

\[
15 \left( \frac{3}{5}x + \frac{1}{3} \right) < \left( \frac{4}{5}x - \frac{1}{3} \right) 15
\]

\[
9x + 5 < 12x - 5
\]

\[
\begin{align*}
9x + 10 & < 12x \\
-9x & < -9x
\end{align*}
\]

\[
\frac{10}{3} < 3x
\]

\[
\frac{10}{9} < x
\]

Score 2: The student gave a complete and correct response.
Question 29

29 Solve \( \frac{3}{5}x + \frac{1}{3} \leq \frac{4}{5}x - \frac{1}{3} \) for \( x \).

\[
\frac{3}{5}x + \frac{1}{3} \leq \frac{4}{5}x - \frac{1}{3} \\
\frac{3}{5}x \leq \frac{4}{5}x - \frac{2}{3} \\
-\frac{1}{5}x \leq -\frac{2}{3} \\
x \geq \frac{10}{3}
\]

Score 1: The student did not switch the inequality symbol when dividing by \(-\frac{1}{5}\).
Question 29

29 Solve \( \frac{3}{5} x + \frac{1}{3} < \frac{4}{3} x - \frac{1}{3} \) for \( x \).

\[-\frac{1}{2} \quad -\frac{1}{2} \]

\[ \frac{3}{5} x < \frac{4}{3} x - \frac{1}{3} - \frac{1}{3} \]

\[ \frac{3}{5} x < \frac{4}{3} x - .67 \]

\[ -\frac{4}{15} x \quad -\frac{4}{15} x \]

\[ -\frac{2}{3} x < -.67 \]

\[ -\frac{2}{3} \]

\[ x > 3.35 \]

Score 1: The student made an error by rounding \( -\frac{2}{3} \).
Question 29

29 Solve $\frac{3}{5}x + \frac{1}{3} < \frac{4}{5}x - \frac{1}{3}$ for $x$.

Score 0: The student made more than one computational error.
30 Is the product of two irrational numbers always irrational? Justify your answer.

The product of two irrational numbers is only sometimes irrational. It is possible that two irrational #s will form a rational #

Ex: \( \sqrt{5} \times \sqrt{12} = \sqrt{60} = \text{irrational} \)

\( \sqrt{8} \times \sqrt{2} = \sqrt{16} = 4 \) \( \text{ rational} \)

Score 2: The student gave a complete and correct response.
Question 30

30 Is the product of two irrational numbers always irrational? Justify your answer.

No, it is not.

\( \sqrt{2} \) is an irrational number.

\[ \sqrt{2} \times \sqrt{2} = \sqrt{4} = 2 \]

2 is a rational number.

Score 2: The student gave a complete and correct response.
30 Is the product of two irrational numbers always irrational? Justify your answer.

The product of two irrational numbers is sometimes irrational, because it depends on what type of irrational number.

Score 1: The student gave an incomplete justification.
Question 30

30 Is the product of two irrational numbers always irrational? Justify your answer.

\[ \sqrt{15} \cdot \sqrt{11} = \sqrt{165} \]
\[ \sqrt{12} \cdot \sqrt{3} = \sqrt{36} \]
\[ \sqrt{5} \cdot \sqrt{7} = \sqrt{35} \]
\[ \sqrt{6} \cdot \sqrt{3} = \sqrt{78} \]
\[ \sqrt{33} \cdot \sqrt{10} = \sqrt{330} \]

Yes, because every time I multiplied I got I.
30 Is the product of two irrational numbers always irrational? Justify your answer.

No because, if you do a negative irrational number multiplied by another negative irrational number it'll give you a positive rational number.

Ex: \(-3 \times -3 = 9\)
\(-7 \times -7 = 49\)
\(-7 \times -3 = 21\)

Score 0: The student gave a completely incorrect response.
31. Solve \(6x^2 - \frac{16}{x} + 2 = 0\) for the exact values of \(x\).

The student gave a complete and correct response.

Score 2:  The student gave a complete and correct response.
31. Solve $6x^2 - 42 = 0$ for the exact values of $x$.

$$6x^2 - 42 = 0$$

$$-b \pm \sqrt{b^2 - 4ac}$$

$$\frac{2a}{2a}$$

$$0 \pm \sqrt{6-4(6x-42)} \Rightarrow 0 \pm \frac{\sqrt{1008}}{12}$$

$$0 + \frac{\sqrt{1008}}{12} = 2.645751311$$

$$0 - \frac{\sqrt{1008}}{12} = -2.645751311$$

$x = 2.645751311$

$x = -2.645751311$

Score 1:  The student expressed the answers as decimals using the full display of the calculator.
31. Solve $6x^2 - 42 = 0$ for the exact values of $x$.

\[ 6x^2 = 42 \]
\[ x^2 = 7 \]
\[ x = \pm \sqrt{7} \]
\[ x = \pm 2.65 \]

Score 1: The student stated $\pm \sqrt{7}$, but expressed the answer as a rounded decimal.
Question 31

31. Solve $6x^2 - 42 = 0$ for the exact values of $x$.

\[
\begin{align*}
6x^2 - 42 &= 0 \\
6x^2 &= 42 \\
x^2 &= \frac{42}{6} \\
x^2 &= 7 \\
x &= \sqrt{7}
\end{align*}
\]

Score 1: The student gave only the positive value of $x$. 
Question 31

31. Solve $6x^2 - 42 = 0$ for the exact values of $x$.

\[
6x^2 = 42 \\
\sqrt{x^2} = \sqrt{7} \\
x = 2.6
\]

Score 0: The student only stated one solution and expressed the answer as a rounded decimal.
31. Solve $6x^2 - 42 = 0$ for the exact values of $x$.

\[
6x^2 - 42 = 0
\]
\[
6x^2 = 42
\]
\[
\sqrt{6x^2} = \sqrt{42}
\]
\[
2.45x = 6.48
\]
\[
x = 2.644897959
\]

Score 0: The student made multiple errors.
Graph the function: \[ h(x) = \begin{cases} 2x - 3, & x < 0 \\ x^3 - 4x - 5, & 0 \leq x \leq 5 \end{cases} \]

**Score 2:** The student gave a complete and correct response.
32 Graph the function: \( h(x) = \begin{cases} 2x - 3, & x < 0 \\ x^2 - 4x - 5, & 0 \leq x \leq 5 \end{cases} \)

Score 1: The student graphed \( h(x) = 2x - 3 \) over the interval \(-3 \leq x < 0\).
Question 32

32 Graph the function: 

\[ h(x) = \begin{cases} 
2x - 3, & x < 0 \\
-x^3 - 4x - 5, & 0 \leq x \leq 5 
\end{cases} \]

Score 0: The student graphed \( h(x) = 2x - 3 \) for \( x \geq 0 \) and \( h(x) = x^3 - 4x - 5 \) for \( x \geq 1 \).
Question 33

33 On the set of axes below, graph the following system of inequalities:

\[
\begin{align*}
2x + y &\geq 8 \\
-2x &\geq -2x \\
2x + y &\geq 8 \\
y - 5 &< 3x \\
y - 5 &< 3x + 5
\end{align*}
\]

Determine if the point (1,8) is in the solution set. Explain your answer.

**Score 4:** The student gave a complete and correct response.
33 On the set of axes below, graph the following system of inequalities:

\[
\begin{align*}
4 & \geq -2x + 8 \\
4 & \leq 3x + 5
\end{align*}
\]

\[\begin{align*}
-2x + y & \geq 8 \\
y - 5 & \leq 3x
\end{align*}\]

Determine if the point (1, 8) is in the solution set. Explain your answer.

No, because it lies on a less than line. Less than lines do not include the points on said line.

**Score 3:** The student did not label either inequality on the graph.
33 On the set of axes below, graph the following system of inequalities:

\[
\begin{align*}
2x + y & \geq 8 \\
y - 5 & < 3x
\end{align*}
\]

Determine if the point \((1,8)\) is in the solution set. Explain your answer.

\[
\begin{align*}
2 + 8 & \geq 8 \\
10 & \geq 8 \checkmark \\
8 - 5 & \leq 3(1) \\
3 & \leq 3
\end{align*}
\]

Score 3: The student gave a justification, not an explanation.
Question 33

33 On the set of axes below, graph the following system of inequalities:

\[
\begin{align*}
2x + y & \geq 8 \\
-2x & \\
-2x & \\
y & \geq -2x + 8 \\
2x + y & \geq 8 \\
y - 5 & < 3x \\
\frac{y - 5}{+5} & \\
\frac{3x}{+5} & \\
y & < 3x + 5
\end{align*}
\]

Determine if the point (1,8) is in the solution set. Explain your answer.

Yes, (1,8) lies on the solid line and is in the solution set.

Score 3: The student made a graphing error by switching solid and dashed lines, but gave an appropriate explanation.
33 On the set of axes below, graph the following system of inequalities:

\[
\begin{align*}
2x + y &\geq 8 \\
y - 5 &< 3x
\end{align*}
\]

Determine if the point (1,8) is in the solution set. Explain your answer.

\((1,8)\) is not a solution because the lines do not cross at \((1,8)\) on the graph.

**Score 3:** The student graphed \(2x + y = 8\) and \(y - 5 = 3x\) correctly and gave an appropriate determination and explanation.
33 On the set of axes below, graph the following system of inequalities:

\begin{align*}
\frac{y-5}{3} &< 3x \\
\frac{y+5}{2} &> 5 \\
y &< 3x+5
\end{align*}

\begin{align*}
2x + y &\geq 8 \\
y - 5 &< 3x
\end{align*}

Determine if the point \((1,8)\) is in the solution set. Explain your answer.

No, the point \((1,8)\) is exactly on the line.

**Score 2:** The student graphed \(y - 5 < 3x\) correctly, but wrote an incomplete explanation.
33 On the set of axes below, graph the following system of inequalities:

\[
\begin{align*}
2x + y & \geq 8 \\
y & \leq \frac{5}{3}x + 5
\end{align*}
\]

Determine if the point \((1, 8)\) is in the solution set. Explain your answer.

\((1, 8)\) is not in the solution set.

**Score 1:** The student graphed \(2x + y = 8\) and \(y - 5 = 3x\) correctly, but did not write an explanation.
Question 33

33 On the set of axes below, graph the following system of inequalities:

\[ y \leq 4x \]
\[ y \leq 3x + 6 \]
\[ y \leq 3x + 5 \]

Determine if the point (1,8) is in the solution set. Explain your answer.

Yes. The point (1,8) is in the shaded area.

Score 0: The student did not show enough correct work to receive any credit.
Question 34

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment $t$ years after Alexander’s birth.

$$ A(t) = 5000(1 + 0.012)^t $$

Determine, to the nearest dollar, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

$$ 3000(1.012)^{32} - 5000(1.012)^{17} $$

\[ \text{\$1200} \]

Score 4: The student gave a complete and correct response.
On the day Alexander was born, his father invested $5000 in an account with a 1.2\% annual growth rate. Write a function, \( A(t) \), that represents the value of this investment \( t \) years after Alexander’s birth.

\[
A(t) = 5000 (1 + 0.012)^t
\]

Determine, to the nearest dollar, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

\[
17: 5000 (1 + 0.012)^{17} = 6124
\]

\[
32: 5000 (1 + 0.012)^{32} = 7324
\]

At 32 years old he will be $1200 dollars more than when he would be 17.

Score 4: The student gave a complete and correct response.
Question 34

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2\% annual growth rate. Write a function, \( A(t) \), that represents the value of this investment \( t \) years after Alexander’s birth.

\[
A(t) = 5000 (1 + 0.012)^t
\]

Determine, to the nearest dollar, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

\[
A(17) = 5000 (1 + 0.012)^{17}
\]

\[
A(32) = 5000 (1 + 0.012)^{32}
\]

17 years = $6124.05

32 years = $7323.97

At the age of 32, Alexander will have $1199.92 more than when he was 17.

Score 3:  The student did not express their answer to the nearest dollar.
Question 34

On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment $t$ years after Alexander’s birth.

Determine, to the nearest dollar, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

\[
\begin{align*}
\text{17 yrs} &= 6124 \\
\text{3 yrs} &= 7324 \\
\text{7324} - \text{6124} &= 1200 \\
\end{align*}
\]

Score 3: The student wrote an expression and used it to determine the correct difference.
Question 34

34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, \( A(t) \), that represents the value of this investment \( t \) years after Alexander’s birth.

\[
A(t) = 5000(1 + 0.012)^t
\]

Determine, to the nearest dollar, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

\[
\begin{align*}
\frac{2}{1} & \frac{12}{7} \\
A(17) &= 5000(1 + 0.012)^{17} \\
A(32) &= 5000(1 + 0.012)^{32} \\
A(32) &= 5979.67 \\
\end{align*}
\]

Score 2: The student wrote a correct function, but no further correct work was shown.
Question 34

On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment $t$ years after Alexander’s birth.

$$A(t) = 1.2^t + 5000$$

Determine, to the nearest dollar, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

$$A(32) = 1.2(32) + 5000 = 51,038$$

$$A(17) = 1.2(17) + 5000 = 5020$$

Score 1: The student used an incorrect function to find the value at 32 and 17 years, but did not find the difference.
34 On the day Alexander was born, his father invested $5000 in an account with a 1.2% annual growth rate. Write a function, $A(t)$, that represents the value of this investment $t$ years after Alexander’s birth.

\[ 5000 + \frac{1.2}{100} \]

Determine, to the nearest dollar, how much more the investment will be worth when Alexander turns 32 than when he turns 17.

Score 0: The student did not show any correct work.
35 Stephen collected data from a travel website. The data included a hotel’s distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

<table>
<thead>
<tr>
<th>Distance From Times Square (city blocks) ( (x) )</th>
<th>0</th>
<th>0</th>
<th>1</th>
<th>1</th>
<th>3</th>
<th>4</th>
<th>7</th>
<th>11</th>
<th>14</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of a Room (dollars) ( (y) )</td>
<td>293</td>
<td>263</td>
<td>244</td>
<td>224</td>
<td>185</td>
<td>170</td>
<td>219</td>
<td>153</td>
<td>136</td>
<td>111</td>
</tr>
</tbody>
</table>

Write the linear regression equation for this data set. Round all values to the nearest hundredth.

\[ y = -7.76x + 246.34 \]

State the correlation coefficient for this data set, to the nearest hundredth.

\[ r = -0.88 \]

Explain what the sign of the correlation coefficient suggests in the context of the problem.

The negative sign suggests a negative correlation. As the distance from Times Square increases, the cost of a room decreases.

Score 4: The student gave a complete and correct response.
Stephen collected data from a travel website. The data included a hotel’s distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

<table>
<thead>
<tr>
<th>Distance From Times Square (city blocks) (x)</th>
<th>0</th>
<th>0</th>
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<th>1</th>
<th>3</th>
<th>4</th>
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<td>170</td>
<td>219</td>
<td>153</td>
<td>136</td>
<td>111</td>
</tr>
</tbody>
</table>

Write the linear regression equation for this data set. Round all values to the nearest hundredth.

\[ y = -7.716x + 246.34 \]

State the correlation coefficient for this data set, to the nearest hundredth.

\[ r = -0.88 \]

Explain what the sign of the correlation coefficient suggests in the context of the problem.

The sign of correlation suggests the strength of the line and if its positive or negative. This has a negative and strong fit.

**Score 3:** The student did not explain the sign in the context of the problem.
35 Stephen collected data from a travel website. The data included a hotel’s distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

<table>
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<tr>
<th>Distance From Times Square (city blocks) (x)</th>
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<td>170</td>
<td>219</td>
<td>153</td>
<td>136</td>
<td>111</td>
</tr>
</tbody>
</table>

Write the linear regression equation for this data set. Round all values to the nearest hundredth.

\[ y = ax + b \]

\[ a = -\frac{17}{7} \]

\[ b = 246.34 \]

State the correlation coefficient for this data set, to the nearest hundredth.

Explain what the sign of the correlation coefficient suggests in the context of the problem.

Score 2: The student wrote the linear regression formula and gave correct values for \( a \) and \( b \).
Stephen collected data from a travel website. The data included a hotel’s distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

<table>
<thead>
<tr>
<th>Distance From Times Square (city blocks) (x)</th>
<th>0</th>
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<th>1</th>
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<th>3</th>
<th>4</th>
<th>7</th>
<th>11</th>
<th>14</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of a Room (dollars) (y)</td>
<td>293</td>
<td>263</td>
<td>244</td>
<td>224</td>
<td>185</td>
<td>170</td>
<td>219</td>
<td>153</td>
<td>136</td>
<td>111</td>
</tr>
</tbody>
</table>

Write the linear regression equation for this data set. Round all values to the nearest hundredth.

\[ a \cdot x + b \]

\[ -7.76(x) + 246.34 \]

\[ r = -0.88 \]

State the correlation coefficient for this data set, to the nearest hundredth.

Explain what the sign of the correlation coefficient suggests in the context of the problem.

**Score 2:** The student wrote a correct expression and correlation coefficient.
35 Stephen collected data from a travel website. The data included a hotel’s distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

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<td>136</td>
<td>111</td>
</tr>
</tbody>
</table>

Write the linear regression equation for this data set. Round all values to the nearest hundredth.

\[ y = ax + b \]

\[ a \approx -9.50 \]

\[ b \approx 245.05 \]

State the correlation coefficient for this data set, to the nearest hundredth.

\[ r = -0.764747... \]

\[ r \approx -0.76 \]

Explain what the sign of the correlation coefficient suggests in the context of the problem.

The negative sign of the correlation coefficient suggests that the cost of a hotel room goes down the farther it is away from Times Square.

Score 1: The student wrote a correct explanation based on their correlation coefficient.
Stephen collected data from a travel website. The data included a hotel's distance from Times Square in Manhattan and the cost of a room for one weekend night in August. A table containing these data appears below.

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</table>

Write the linear regression equation for this data set. Round all values to the nearest hundredth.

\[ y \approx 88 \]

State the correlation coefficient for this data set, to the nearest hundredth.

\[ r \approx -0.76 \]

Explain what the sign of the correlation coefficient suggests in the context of the problem.

The negative sign suggests a negative relationship, meaning that as the distance from Times Square increases, the cost of a room decreases.
A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

![Graph showing accumulated snowfall over time](image)

Determine the average rate of snowfall over the length of the storm. State the rate, to the nearest hundredth of an inch per hour. \[
\frac{10 \text{ inches}}{17 \text{ hours}} = 0.5882352941 \]

The average was 0.59

Score 4: The student gave a complete and correct response.
Question 36

36 A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

Score 3: The student stated an incorrect average rate of snowfall.
A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

Determine the average rate of snowfall over the length of the storm. State the rate, to the nearest hundredth of an inch per hour.

Score 2: The student did not connect the points on the graph and did not state an average rate of snowfall.
A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

Determine the average rate of snowfall over the length of the storm. State the rate, to the nearest hundredth of an inch per hour.

Score 1: The student stated a correct rate of change.
36 A snowstorm started at midnight. For the first 4 hours, it snowed at an average rate of one-half inch per hour.

The snow then started to fall at an average rate of one inch per hour for the next 6 hours.

Then it stopped snowing for 3 hours.

Then it started snowing again at an average rate of one-half inch per hour for the next 4 hours until the storm was over.

On the set of axes below, graph the amount of snow accumulated over the time interval of the storm.

\[ \text{Elapsed Time (in hours)} \]

\[ \text{Accumulated Snowfall (in inches)} \]

\[ \dfrac{1 \text{ hour}}{0.5 \text{ inch}} = 2 \text{ inches per hr.} \]

Score 0: The student showed no correct work.
Question 37

Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, \( A \), and the number of Delaware chickens, \( D \), she purchased.

\[
3.75A + 2.50D = 35
\]
\[
A + D = 12
\]

Determine algebraically how many of each type of chicken Allysa purchased.

\[
\begin{align*}
A + D &= 12 \\
- D - D &= \\
A &= 12 - D \\
\hline
A + D &= 12 \\
A + 8 &= 12 \\
- 8 - 8 &= \\
A &= 4 \\
\end{align*}
\]

\[
\begin{align*}
3.75(12 - D) + 2.50D &= 35 \\
45 - 3.75D + 2.50D &= 35 \\
45 - 1.25D &= 35 \\
-1.25D &= -10 \\
D &= 8
\end{align*}
\]

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

\[
\begin{align*}
4 \times 2 &= 8 \\
8 \times 7 &= 56 \\
\hline
8 \times 1 &= 8 \\
56 \times 2 &= 112 \\
\hline
& 112 \\
& 8 \times 2.50 = 22.5
\end{align*}
\]

Score 6: The student gave a complete and correct response.
37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, \( A \), and the number of Delaware chickens, \( D \), she purchased.

\[
3.75A + 2.50D = 35 \\
A + D = 12
\]

Determine algebraically how many of each type of chicken Allysa purchased.

\[
\begin{align*}
4 \text{- american} & : 7 + 5 = 12 \\
8 \text{- delaware} & : 10 + 2 = 12 \\
6 & : 6 \\
4 & : 8
\end{align*}
\]

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

\[
\begin{align*}
\text{Americana} & : 2x4x7 = 56 \text{ eggs a week} \\
\text{Delaware} & : 1x8x7 = 56 \text{ eggs a week} \\
56 + 56 & = 112 \\
112 \div 12 & = 9.3
\end{align*}
\]

**Score 5:** The student used a method other than algebraic to determine \( A = 4 \) and \( D = 8 \).
37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, $A$, and the number of Delaware chickens, $D$, she purchased.

$$35 = 3.75A + 2.50D$$
$$12 = A + D$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$35 = 3.75A + 2.50D$$
$$2.50(12 = A + D)$$

$$3.75A + 2.50D = 35$$
$$-2.50A - 2.50D = -30$$

$$1.25A = 5$$
$$A = 4$$
$$12 = A + D$$
$$12 = 4 + D$$
$$D = 8$$

Allysa bought 4 Americana chickens, and 8 Delaware chickens.

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

American: $4(2) = 8$ eggs a day
Delaware: $8(1) = 8$ eggs a day
$16$ eggs a day
$7(16) = 112$ eggs/week

$$9.33\text{ dozens a week}$$
$$9.33(2.50)$$

$\$23.33$ per week

Score 5: The student found revenue for $9\frac{1}{3}$ dozen eggs instead of 9 dozen.
Question 37

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, $A$, and the number of Delaware chickens, $D$, she purchased.

\[
\begin{align*}
A + D &= 12 \\
3.75A + 2.50D &= 35
\end{align*}
\]

Determine algebraically how many of each type of chicken Allysa purchased.

\[
\begin{align*}
3.75A + 2.50D &= 35 \\ 
3.75A + 2.50D &= 35 - 2.50D \\
\frac{3.75 - 2.50}{3.75} &= \frac{35}{3.75} \\
A &= 7 \\
D &= 8
\end{align*}
\]

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

\[
\begin{align*}
7(2) &= 14 	imes 7 = 98 \\
8(1) &= 8 	imes 7 = 56 \\
\frac{154}{12} &= 12.83 \\
12 \times 2.50 &= 30
\end{align*}
\]

Score 4: The student wrote a correct system of equations and stated values for $A = 7$ and $D = 8$, which they used to determine an appropriate amount of money.
Question 37

Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, $A$, and the number of Delaware chickens, $D$, she purchased.

$$3.75A + 2.50D = 35$$

$$A + D = 12$$

Determine algebraically how many of each type of chicken Allysa purchased.

$$A = 4, \quad D = 8$$

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

Score 3: The student wrote a correct system of equations and stated $A = 4$ and $D = 8$. 
37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. American chickens cost $8.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

\[3.75A + 2.50D = 35\]

Determine algebraically how many of each type of chicken Allysa purchased.

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

\[
\begin{align*}
1 \text{ day} & \rightarrow 7 + 1 = 8 \text{ eggs} \\
2 \text{ days} & \rightarrow 4 + 2 = 6 \text{ eggs} \\
3 \text{ days} & \rightarrow 8 + 3 = 11 \text{ eggs} \\
4 \text{ days} & \rightarrow 16 + 4 = 19 \text{ eggs} \\
5 \text{ days} & \rightarrow 32 + 5 = 37 \text{ eggs}
\end{align*}
\]

\[2.50(4) = 10 \text{ for } 4 \text{ days} = $10\]

\[2.50(341) = 852.5 \text{ for } 341 \text{ eggs} = $852.5\]

Score 2: The student wrote one correct equation and stated A = 4 and D = 8.
Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, $A$, and the number of Delaware chickens, $D$, she purchased.

Determine algebraically how many of each type of chicken Allysa purchased.

$$35 = 3.75A + 2.50D$$

\[
\begin{align*}
12 &= A + D \\
-D &
\end{align*}
\]

\[
\begin{align*}
12 - D &= A \\
3.75(12 - D) + 2.50D &= 35 \\
-4.50D + 2.50D &= 35 \\
-42 \cdot 50D &= 35 \\
\frac{-42.50D}{-42.50} &= \frac{35}{42.50}
\end{align*}
\]

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

$7.50 per week

Score 2: The student wrote a correct system of equations.
Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

$$3.75x + 2.50y = 35$$
$$x + y = 12$$

Determine algebraically how many of each type of chicken Allysa purchased.

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

**Score 2:** The student wrote an appropriate system of equations, but not in terms of A and D. The student stated appropriate values for their system.
Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, $A$, and the number of Delaware chickens, $D$, she purchased.

\[
\begin{align*}
3.75A + 2.50D &= 35 \\
A + D &= 12
\end{align*}
\]

Determine algebraically how many of each type of chicken Allysa purchased.

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

Score 1: The student stated correct values for $A$ and $D$. 
Question 37

37 Allysa spent $35 to purchase 12 chickens. She bought two different types of chickens. Americana chickens cost $3.75 each and Delaware chickens cost $2.50 each.

Write a system of equations that can be used to determine the number of Americana chickens, A, and the number of Delaware chickens, D, she purchased.

\[
3.75 \times A = X \\
2.50 \times D = X
\]

Determine algebraically how many of each type of chicken Allysa purchased.

\[
3.75 = 1 \\
2.50 = 1
\]

She can buy

a Americana chicken.

14 Delaware chicken.

Each Americana chicken lays 2 eggs per day and each Delaware chicken lays 1 egg per day. Allysa only sells eggs by the full dozen for $2.50. Determine how much money she expects to take in at the end of the first week with her 12 chickens.

$4 is what she will take in each week.

Score 0: The student showed no correct work.