The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

INTEGRATED ALGEBRA

Thursday, June 18, 2015 — 9:15 a.m. to 12:15 p.m., only

SAMPLE RESPONSE SET

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</tbody>
</table>
31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the nearest tenth.

\[
\frac{170 \text{ miles}}{2 \text{hr} 45 \text{mins}} \rightarrow 61.81
\]

\[
61.8
\]

**Score 2:** The student has a complete and correct response.
31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the nearest tenth.

\[
\frac{170}{1\frac{45}{60}} \approx 61.8
\]

Score 2: The student has a complete and correct response.
31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the nearest tenth.

\[
\frac{170}{2.75} = 61.818
\]

\[
= 61.82
\]

**Score 1:** The student made one error by rounding to the wrong decimal place.
31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the nearest tenth.

\[
\frac{170}{2.75} \rightarrow 69.3871551
\]

Score 0: The student made one conceptual error and one rounding error.
31 Jen traveled a distance of 170 miles in 2 hours and 45 minutes. Express her speed, in miles per hour, to the nearest tenth.

\[
\frac{170}{16.5} = 1.0303
\]

\[\approx 1.03\]

**Score 0:** The student made one conceptual error by finding miles per minutes and did not round correctly.
32 As shown below, polygon $ABCGFED$ consists of two squares, $ABCD$ and $CGFE$, and an equilateral triangle $CED$. The length of $BC$ is $\sqrt{3}$ cm. Determine the perimeter of polygon $ABCGFED$ in radical form.

Score 2: The student has a complete and correct response.
32 As shown below, polygon $ABCGFED$ consists of two squares, $ABCD$ and $CGFE$, and an equilateral triangle $CED$. The length of $BC$ is $\sqrt{3}$ cm. Determine the perimeter of polygon $ABCGFED$ in radical form.

Score 2: The student expressed the perimeter as the product of the number of sides and the length of a side. The student then wrote a radical equivalent to $7\sqrt{3}$.
32 As shown below, polygon $ABCGFED$ consists of two squares, $ABCD$ and $CGFE$, and an equilateral triangle $CED$. The length of $BC$ is $\sqrt{3}$ cm. Determine the perimeter of polygon $ABCGFED$ in radical form.

Score 1: The student showed correct work to find $\sqrt{3} \times 7$, but identified the decimal as the answer.
32 As shown below, polygon $ABCGFED$ consists of two squares, $ABCD$ and $CGFE$, and an equilateral triangle $CED$. The length of $BC$ is $\sqrt{3}$ cm. Determine the perimeter of polygon $ABCGFED$ in radical form.

Score 1: The student has the correct response, but no work is shown.
32 As shown below, polygon $ABCGFED$ consists of two squares, $ABCD$ and $CGFE$, and an equilateral triangle $CED$. The length of $BC$ is $\sqrt{3}$ cm. Determine the perimeter of polygon $ABCGFED$ in radical form.

\[ \sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} + \sqrt{3} = \sqrt{21} \]

\[ \text{Perimeter of figure } ABCGFE = \sqrt{21} \text{ cm.} \]

**Score 1:** The student showed appropriate work to find the perimeter, but made a conceptual error when adding the radicals.
32 As shown below, polygon $ABCGFED$ consists of two squares, $ABCD$ and $CGFE$, and an equilateral triangle $CED$. The length of $BC$ is $\sqrt{3}$ cm. Determine the perimeter of polygon $ABCGFED$ in radical form.

Score 1: The student made a conceptual error by including all the sides of the equilateral triangle when calculating the perimeter of polygon $ABCGFED$. 

$\text{Perimeter} = 9\sqrt{3}$
32 As shown below, polygon $ABCGFED$ consists of two squares, $ABCD$ and $CGFE$, and an equilateral triangle $CED$. The length of $BC$ is $\sqrt{3}$ cm. Determine the perimeter of polygon $ABCGFED$ in radical form.

Score 0: The student made more than one error when finding the perimeter.
33 Write a quadratic equation in standard form that has roots of $-12$ and $2$.

\[
(x+12)(x-2) = 0 \\
x^2 + 10x - 24 = 0
\]

**Score 2:** The student has a complete and correct response.
33 Write a quadratic equation in standard form that has roots of $-12$ and $2$.

\[ \frac{x^2 - 12x + 12}{x + 12 \cdot (x - 2)} = 0 \]

\[ \frac{x^2 + 10x - 24}{x + 12 \cdot (x - 2)} = 0 \]

\[ x = -12 \]

\[ x = 2 \]

\[ x^2 + 10x - 24 \]

\[ x = -2 \]

\[ x = 2 \]

\[ t \]

\[ \text{ans} \]

**Score 1:** The student showed appropriate work, but wrote an expression instead of an equation.
Question 33

33 Write a quadratic equation in standard form that has roots of $-12$ and $2$.

$$\begin{aligned} (x+12)(x-2) &= 0 \\ x^2 + 10x - 24 &= 0 \end{aligned}$$

**Score 1:** The student wrote a correct equation in factored form but forgot “$x$” on the middle term when multiplying the factors.
33 Write a quadratic equation in standard form that has roots of $-12$ and $2$.

\[ (x + 12)(x + 2) = 0 \]

\[ x^2 + 2x + 12x + 24 = 0 \]

\[ x^2 + 14x + 24 = 0 \]

**Score 1:** The student made an error in writing the second factor of the equation, but wrote an appropriate quadratic equation.
33 Write a quadratic equation in standard form that has roots of $-12$ and $2$.

\[
\begin{align*}
  x &= -12 \\
  x &= 2
\end{align*}
\]

\[
(0 = (x + 12)(x - 2))
\]

\[
\begin{align*}
  x &= -12 \\
  x &= +2
\end{align*}
\]

**Score 1:** The student wrote a correct equation in factored form, but showed no further correct work.
Question 33

33 Write a quadratic equation in standard form that has roots of $-12$ and $2$.

\[
\begin{align*}
&x = -12 \\
&x + 12 = 0 \\
&(x + 12)\quad(\text{or}\quad(x - 2) \\
&x^2 - 2x + 12x - 24 \\
&x^2 + 10x - 24
\end{align*}
\]

\[y = x^2 + 10x - 24\]

Score 1: The student showed appropriate work, but set the correct expression equal to $y$. 
33 Write a quadratic equation in standard form that has roots of $-12$ and $2$.

\[
\begin{align*}
(x + 12)(x - 2) &= 0 \\
\Rightarrow x &= -12, 2
\end{align*}
\]

**Score 0:** The student wrote the expression $(x + 12)(x - 2)$, but showed no further correct work.
Question 33

33 Write a quadratic equation in standard form that has roots of $-12$ and $2$.

\[
(x - 12)(x + 2)
\]

\[
x^2 + 2x - 24
\]

\[
-12x
\]

\[
x^2 - 16x - 24
\]

**Score 0:** The student wrote incorrect factors and did not write an equation.
Question 34

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation \( y = -x^2 - 2x + 1 \).

\[
\begin{align*}
\text{Vertex: } & \quad \text{Axis of Symmetry: } \frac{-b}{2a} \\
\text{Vertex: } & \quad \text{Axis of Symmetry: } \frac{-(-2)}{2(-1)} \\
& \quad \text{Axis of Symmetry: } \frac{2}{-2} \\
& \quad \text{Axis of Symmetry: } -1 \\
& \quad -(-1)^2 - 2(-1) + 1 \\
& \quad -1 + 2 + 1 \\
& \quad -1 + 3 \\
& \quad 2 \\
& \quad (-1, 2)
\end{align*}
\]

Score 3: The student has a complete and correct response.
Question 34

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation \( y = -x^2 - 2x + 1 \).

\[
\begin{align*}
x &= \frac{-b}{2a} \\
&= \frac{-(-2)}{2(-1)} \\
&= \frac{2}{-2} = 1
\end{align*}
\]

Axis of symmetry: \( x = 1 \)

\[
\begin{align*}
y &= -1 - 2 + 1 \\
y &= -2
\end{align*}
\]

Vertex: \((1, -2)\)

Score 2: The student made an error in finding the axis of symmetry, but found an appropriate vertex.
Question 34

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

\[
\begin{align*}
-\frac{b}{2a} &= -\frac{(-2)}{2} = -1 \\
&= x = -1 \\
\end{align*}
\]

\[
\begin{align*}
y &= -(-1)^2 - 2(-1) + 1 = 2 \\
&= y = 2 \\
&= (-1, 2)
\end{align*}
\]

**Score 2:** The student showed appropriate work to find the vertex, but did not state the axis of symmetry correctly.
Question 34

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation \( y = -x^2 - 2x + 1 \).

\[
\frac{-b}{2a} = \frac{-(2)}{2(-1)} = \frac{2}{-2} = -1
\]

\[
y = -(-1)^2 - 2(-1) + 1
\]

\[
= -1 + 2 + 1
\]

\[
= 2
\]

Score 1: The student forgot to write “x” in the equation for the axis of symmetry and did not write parentheses around the coordinates of the vertex.
Question 34

34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation \( y = -x^2 - 2x + 1 \).

\[
\begin{align*}
    x &= -1 \\
    (-1, \, a) \\
    \text{used a TI}
\end{align*}
\]

Score 1: The student wrote a correct response, but showed no work.
34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation \( y = -x^2 - 2x + 1 \).

\[
\begin{align*}
\text{Axis of Symmetry} & \quad \frac{-b}{2a} = \frac{2}{2} = -1 \\
X & = -1
\end{align*}
\]

**Score 1:** The student showed appropriate work to find the axis of symmetry, but showed no further work.
34 Find algebraically the equation of the axis of symmetry and the vertex of the parabola represented by the equation $y = -x^2 - 2x + 1$.

\[-x^2 - 2x + 1 = 0\]
\[x^2 + 2x - 1 = 0\]
\[x^2 + 2x = 1\]
\[x(x + 2) = 1\]
\[x = 1 \quad \text{or} \quad x = -2\]

\(\text{Axis}\) \quad \text{(Vertex)}

**Score 0:** The work done by the student was completely incorrect.
Question 35

35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the nearest thousandth.

\[
\frac{1551.25 - 1512}{1551.25} = \frac{39.25}{1551.25} = 0.0253021757
\]

Score 3: The student has a complete and correct response.
Question 35

Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the nearest thousandth.

\[
\text{RE} = \frac{|\text{measured} - \text{actual}|}{\text{actual}} = \frac{|36 \cdot 42 - 1551.5|}{1551.5}
\]

\[
36 \cdot 42 = 1512
\]
\[
36.5 \cdot 42.5 = 1551.5
\]

\[
\text{RE} = 0.025
\]

Score 3: The student has a complete and correct response.
Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the nearest thousandth.

\[
\frac{\text{actual} - \text{observed}}{\text{actual}}
\]

\[
\begin{align*}
\text{actual} & \quad \text{observed} \\
L \times W &= A \\
36.5 \times 42 &= 1551.25 \\
42 \times 36 &= 1512
\end{align*}
\]

\[
RE = \frac{1551.25 - 1512}{1551.25} = 0.03
\]

**Score 2:** The student rounded to the nearest hundredth instead of thousandth.
Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the nearest thousandth.

Score 2: The student made an error by expressing the relative error as a percentage.
Question 35

Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the nearest thousandth.

Score 1: The student made a transcription error when finding the measured area and made a rounding error when finding the relative error.
35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the nearest thousandth.

Score 1: The student made a conceptual error by finding the amount of error instead of the relative error.
35 Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the nearest thousandth.

\[
\text{Relative error} = \frac{H' - L'}{Actual} = \frac{36.5 \times 42.5 - 36 \times 42}{36 \times 42} = \frac{39.25}{1512} = 0.025852
\]

\text{Relative error} = 0.025852

Score 0: The student used an incorrect formula, divided incorrectly, and did not round to the correct decimal place.
Linda measures her rectangular bedroom window for a new shade. The measurements she made are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches. Determine the relative error in calculating the area. Express your answer as a decimal to the nearest thousandth.

Score 0: The student found both areas correctly, but showed no further correct work.
36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald’s freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 68, 72
67, 60, 71, 68, 67, 58, 68, 72, 63, 67

Complete the frequency table below.

<table>
<thead>
<tr>
<th>Heights of Students</th>
<th>Interval</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
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<td>70–74</td>
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</table>

On the grid below, draw and label a frequency histogram for these data.

Score 3:  The student has a complete and correct response.
36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

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On the grid below, draw and label a frequency histogram for these data.

Score 2: The student completed the frequency table correctly and made an appropriate histogram, but did not label it.
36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald’s freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

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On the grid below, draw and label a frequency histogram for these data.

Score 2: The student made an error in completing the frequency table. The student drew and labeled an appropriate histogram.
36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

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On the grid below, draw and label a frequency histogram for these data.

Score 1: The student completed the frequency table correctly, but made a conceptual error by drawing a bar graph.
36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald's freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

Complete the frequency table below.

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On the grid below, draw and label a frequency histogram for these data.

Score 1: The student completed the frequency table correctly, but showed no further correct work.
36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald’s freshman class:

- 63, 56, 67, 59, 70, 69, 62, 74, 66, 72
- 67, 60, 70, 66, 67, 58, 68, 72, 63, 67

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On the grid below, draw and label a frequency histogram for these data.

Score 1: The student completed the frequency table correctly. The student made both graphing and labeling errors when drawing the histogram.
36 The following set of data represents the heights, in inches, of the 20 students in Ms. Fitzgerald’s freshman class:

63, 56, 67, 59, 70, 69, 62, 74, 66, 72
67, 60, 70, 66, 67, 58, 68, 72, 63, 67

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On the grid below, draw and label a frequency histogram for these data.

Score 0: The student made an error in completing the frequency table. The student drew a completely incorrect graph.
37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.
State the roots of $0 = 2x^2 - 4x - 6$.

Score 4: The student has complete and correct work.
37 On the set of axes below, graph \( y = 2x^2 - 4x - 6 \).

State the roots of \( 0 = 2x^2 - 4x - 6 \).

Score 4: The student showed complete and correct work.
37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.

State the roots of $0 = 2x^2 - 4x - 6$.

\[
\begin{align*}
(x = -1 & \quad x = 3) \\
y = 2(x^2 - 2x - 3) & \quad \text{(factored form)} \\
(x+1)(x-3) & \quad \text{(expanded form)}
\end{align*}
\]

\[
\begin{align*}
x^2 + 1 & = 0 \\
x^2 - 3 & \quad \text{(solutions)} \\
x & = -1 \\
x & = 3
\end{align*}
\]

**Score 4:** The student showed complete and correct work.
37 On the set of axes below, graph \( y = 2x^2 - 4x - 6 \).
State the roots of \( 0 = 2x^2 - 4x - 6 \).

Score 3: The student drew a correct graph, but expressed the roots as coordinates.
37 On the set of axes below, graph \( y = 2x^2 - 4x - 6 \).
State the roots of \( 0 = 2x^2 - 4x - 6 \).

Score 3: The student drew a correct graph, but stated only one root, 3.
37 On the set of axes below, graph $y = 2x^2 - 4x - 6$.
State the roots of $0 = 2x^2 - 4x - 6$.

Score 3: The student made one graphing error when plotting the vertex, but stated the correct roots.
37 On the set of axes below, graph \( y = 2x^2 - 4x - 6 \).
State the roots of \( 0 = 2x^2 - 4x - 6 \).

**Score 2:** The student made one graphing error and stated the roots as coordinates.
37 On the set of axes below, graph \( y = 2x^2 - 4x - 6 \).

State the roots of \( 0 = 2x^2 - 4x - 6 \).

\[ x = -1 \text{ and } x = 3 \]

\[
2(x^2 - 2x - 3)
\]

**Score 2:** The student made one conceptual error by factoring out a 2 and graphing \( y = x^2 - 2x - 3 \). The student stated the appropriate roots.
37 On the set of axes below, graph \( y = 2x^2 - 4x - 6 \).

State the roots of \( 0 = 2x^2 - 4x - 6 \).

\begin{align*}
( -3, 1 ) & \\
2x^2 - 4x - 6 &= 0 \\
2 ( x^2 - 2x - 3 ) &= 0 \\
2 ( x - 3 ) ( x + 1 ) &= 0
\end{align*}

**Score 2:** The student drew a correct graph, but showed no further correct work.
37 On the set of axes below, graph \( y = 2x^2 - 4x - 6 \).

State the roots of \( 0 = 2x^2 - 4x - 6 \).

\[
\begin{align*}
\text{Score 2: } & \text{ The student showed appropriate work to find } -1 \text{ and } 3, \text{ but did not draw a graph.}
\end{align*}
\]
On the set of axes below, graph \( y = 2x^2 - 4x - 6. \)

State the roots of \( 0 = 2x^2 - 4x - 6. \)

\[
\begin{align*}
y &= 2(x + 1)(x - 3) \\
x + 1 &= 0 & x - 3 &= 0 \\
x &= -1 & x &= 3 \\
(-1, 0) & (3, 0)
\end{align*}
\]

**Score 1:** The student showed appropriate work to find \(-1\) and \(3\), but did not draw a graph and stated the roots as coordinates.
37 On the set of axes below, graph \( y = 2x^2 - 4x - 6 \).

State the roots of \( 0 = 2x^2 - 4x - 6 \).

Score 0: The student stated \(-1, 0\) and \(3, 0\) and drew a completely incorrect graph.
Question 38

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.

\[
\begin{align*}
\text{length} &= x^2 + 3x + 2 \\
\text{width} &= 4x \\
\end{align*}
\]

\[
\begin{align*}
P &= 3x + 5x + 5x + 5x \\
P &= 4x + 4x \quad \left( x^2 + 3x + 2 \right) + 3x + 2 \\
P &= 2x^2 + 14x + 4 \\
\end{align*}
\]

Express the area of the rectangle as a trinomial.

\[
\begin{align*}
a &= l \cdot w \\
a &= 4x \left( x^2 + 3x + 2 \right) \\
a &= 4x^3 + 12x^2 + 8x \\
\end{align*}
\]

Score 4: The student has a complete and correct solution.
Question 38

38 The length of a rectangle is represented by \( x^2 + 3x + 2 \), and the width is represented by \( 4x \).

Express the perimeter of the rectangle as a trinomial.

\[
2(x^2 + 3x + 2) + 2(4x) = 2x^2 + 6x + 4 + 8x = 2x^2 + 14x + 4
\]

Express the area of the rectangle as a trinomial.

\[
4x(x^2 + 3x + 2) = 4x^3 + 12x^2 + 8x
\]

Score 3: The student made one computational error when distributing.
38 The length of a rectangle is represented by \( x^2 + 3x + 2 \), and the width is represented by \( 4x \).

Express the perimeter of the rectangle as a trinomial.

\[
\begin{align*}
\text{Area} &= \text{length} \times \text{width} \\
A &= 4x(x^2 + 3x + 2) \\
A &= 4x^3 + 12x^2 + 8x
\end{align*}
\]

Score 2:  The student made a conceptual error when finding the perimeter.
38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.

Express the area of the rectangle as a trinomial.

Score 2: The student only found the perimeter correctly.
38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.

\[
\text{perimeter} = 4x + x^2 + 3x + 2 + 4x + x^2 + 3x + 2 = 2x^2 + 14x + 4
\]

Express the area of the rectangle as a trinomial.

\[
4x \cdot x^2 + 3x + 2 = 4x^3 + 3x + 2
\]

Score 2: The student correctly found the perimeter, but made a conceptual error in finding the area.
Question 38

38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.
Express the perimeter of the rectangle as a trinomial.

Express the area of the rectangle as a trinomial.

Score 1: The student correctly calculated the perimeter, but transcribed the circled answer incorrectly (the $x$ has been left out). The student calculated the area incorrectly.
38 The length of a rectangle is represented by $x^2 + 3x + 2$, and the width is represented by $4x$.

Express the perimeter of the rectangle as a trinomial.

Express the area of the rectangle as a trinomial.

Score 0: The student showed no correct work.
Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find \( m \), the maximum number of minutes that Tony can talk on the phone.

\[
\frac{2.10}{0.25} = 8.4 \quad 0.10(m-4) \leq 1.85
\]

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

\[
m - 4 \leq 18.5 \\
m \leq 22.5 \\
22
\]

Score 4: The student has a complete and correct response.
39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find \( m \), the maximum number of minutes that Tony can talk on the phone.

\[
\begin{align*}
25 + 0.10(m-4) &= 2.10 \\
25 + 10m - 0.40 &\leq 2.10 \\
10m - 0.15 &\leq 2.10 \\
10m &\leq 2.25 \\
m &\leq 0.225
\end{align*}
\]

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

\[
m \leq 2.25
\]

\[
m = 2.2
\]

**Score 4:** The student has a complete and correct response.
Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find $m$, the maximum number of minutes that Tony can talk on the phone.

\[\frac{.25}{10} + .10(m-4) \leq 2.10\]

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

\[
.25 + .10m - .4 \leq 2.10
\]

\[
.10m - .15 \leq 2.10
\]

\[
.10m \leq 2.25
\]

\[
m \leq 22.5
\]

**Score 3:** The student wrote the correct inequality and solved it to find $m \leq 22.5$. The student did not find the maximum number of whole minutes.
Question 39

Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find \( m \), the maximum number of minutes that Tony can talk on the phone.

\[
0.25 + 0.10 (m-4) \leq 2.10
\]

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

\[
0.25 + 0.10 (m-4) \leq 2.10
\]

\[
\frac{0.25}{0.10} (m-4) \leq \frac{2.10 - 0.25}{0.10}
\]

\[
m - 4 \leq 19
\]

\[
m \leq 23.5
\]

\[
m = 27
\]

Score 3: The student wrote a correct inequality, but made one computational error in solving it. The student found an appropriate maximum number of minutes.
Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find \( m \), the maximum number of minutes that Tony can talk on the phone.

\[
0.25(4) + 0.10x \leq 2.10
\]

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

\[
0.25(4) + 0.10x \leq 2.10
\]

\[
1 + 0.10x \leq 2.10
\]

\[
\frac{0.10x \leq 1.10}{0.10}
\]

\[
x \leq 11
\]

\[
11 \text{ min}
\]

**Score 2:** The student made a conceptual error in writing the inequality, but solved it appropriately to find the maximum number of minutes.
Question 39

39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find \( m \), the maximum number of minutes that Tony can talk on the phone.

\[
.25 + .10x \leq 2.10
\]

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

\[
\begin{align*}
-0.25 + 0.10x & \leq 2.10 \\
0.10x & \leq 2.35 \\
x & \leq 23.5
\end{align*}
\]

18 minutes

Score 2: The student made a conceptual error in writing the inequality, but solved it appropriately to find the maximum number of minutes.
Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find \( m \), the maximum number of minutes that Tony can talk on the phone.

\[ 0.25m + 0.10 \leq 2.10 \]

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

Score 2: The student used a method other than algebraic to find the 22 minutes.
39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find \( m \), the maximum number of minutes that Tony can talk on the phone.

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

\[
\frac{2.10 - 0.25}{0.10} + 4 = m = 22.5 \text{ min}
\]

**Score 1:** The student did not write a correct inequality, but found \( m = 22.5 \), arithmetically. The student did not find the maximum number of whole minutes.
39 Tony makes a phone call at a pay phone. The charge is 25 cents for the first four minutes, and 10 cents for each additional minute. Tony has $2.10 in change in his pocket. Write an inequality that can be used to find \( m \), the maximum number of minutes that Tony can talk on the phone.

Solve this inequality algebraically to find the maximum number of whole minutes he can talk on the phone.

\[
25 + 0.10x \geq 2.10 \\
-25 \quad -25 \\
0.10x \geq 1.85 \\
\frac{0.10x}{0.10} = \frac{1.85}{0.10} \\
x \geq 18
\]

**Score 0:** The student made more than one conceptual error.