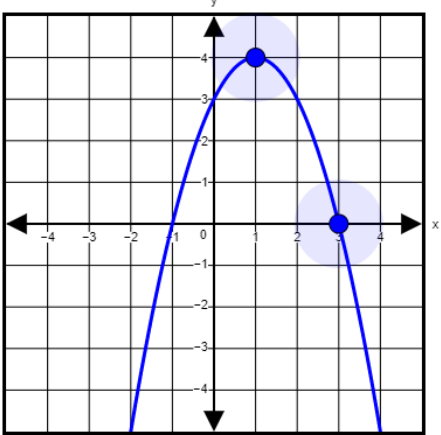
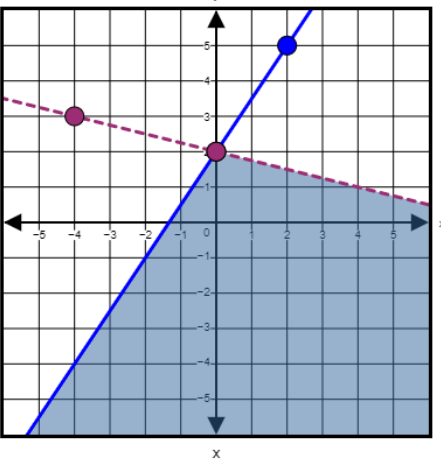




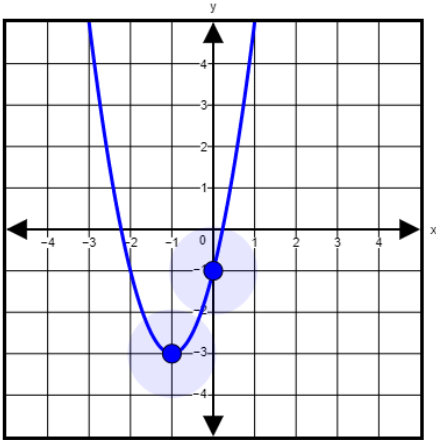
Practice Test Answer and Alignment Document
Mathematics – Grade 10

Part A

Item Number	Answer Key	Kentucky Academic Standard	Mathematical Practices
1.	D	KY.HS.N.2	MP.8
2.		KY.HS.F.4.a	MP.4, MP.5
3.	See rubric	KY.HS.F.7.a	MP.4, MP.5
4.		KY.HS.A.25.b	MP.6

5.

Part A



Part B

See rubric

KY.HS.F.1.e

MP.1

Part B

Item Number	Answer Key	Kentucky Academic Standard	Mathematical Practices
1.	<input type="text" value="Kim's"/> equation would be most appropriate to use to predict a population of <input type="text" value="14,745"/> people in a town with an area of 7.2 square kilometers.	KY.HS.SP.6.a	MP.2, MP.8
2.	C, E	KY.HS.G.6	MP.1
3.	See rubric	KY.HS.F.5.a	MP.2
4.	0.3 or equivalent number	KY.HS.SP.8.a	MP.5
5.	$x = \frac{3+\sqrt{189}}{10}$ and $x = \frac{3-\sqrt{189}}{10}$ or equivalent numbers	KY.HS.A.19.a	MP.7
6.	See rubric	KY.HS.F.3.a	MP.2, MP.4
7.	D	KY.HS.F.3.a	MP.2

Rubrics

Part A #3	
Rubric	
Score Point 2	Student demonstrates a complete understanding of using the formula for an arithmetic sequence to model a situation.
Score Point 1	Student demonstrates a partial understanding of using the formula for an arithmetic sequence to model a situation.
Score Point 0	Student response is insufficient to demonstrate a grade-appropriate, relevant understanding of the task.
Score Points	<ul style="list-style-type: none"> • Score 2 points: <ul style="list-style-type: none"> ○ Correct formula with a complete explanation. • Score 1 point: <ul style="list-style-type: none"> ○ Correct formula with a partial explanation. OR ○ Explanation indicates a partial understanding of using the formula for an arithmetic sequence to generate terms.
Correct Answer	<p>The sequence increases by 3 from one term to the next. I determined this by finding the rate of change.</p> $\frac{23 - 2}{8 - 1} = \frac{21}{7} = 3$ <p>Then I used the formula $a_n = a_1 + (n - 1)d$ to write an equation that could be used to find the nth term of the arithmetic sequence. The initial value, a_1, is 2. The common difference, d, is 3.</p> $a_n = 2 + 3(n - 1)$ <p>Note:</p> <ul style="list-style-type: none"> • Other valid explanations are acceptable. • Equivalent equations are acceptable. • Variable substitution is allowed.

Part A #5

Rubric

The total item score is the sum of points awarded in the Machine-scored and Human-scored parts.

Machine Scoring

Score Point 1	Part A Student response is the correct graph of $f(x)$, with the vertex at $(-1, -3)$.
Score Point 0	Student response is incorrect.

Human Scoring

Score Point 3	Student scores a total of 3 points.
Score Point 2	Student response is incorrect.
Score Point 1	Student demonstrates a minimal understanding of comparing the properties of two functions, each represented in a different way.
Score Point 0	Student response is insufficient to demonstrate a grade-appropriate, relevant understanding of the task.
Score Points	<p>Part B</p> <ul style="list-style-type: none"> • Score 3 points: <ul style="list-style-type: none"> ◦ Complete explanations of how the two functions compare using their values. • Score 2 points: <ul style="list-style-type: none"> ◦ Complete explanation of how the minima compare using their values with a partial explanation of how the widths compare. OR ◦ Complete explanation of how the widths compare using their values with a partial explanation of how the minima compare. • Score 1 point: <ul style="list-style-type: none"> ◦ Partial explanation of how the minima compare using their values with a partial explanation of how the widths compare. OR ◦ Only one of the explanations is complete. OR ◦ Partial explanation of how the minima compare using their values with a minimal explanation of how the widths compare. OR ◦ Partial explanation of how the widths compare using their values with a minimal explanation of how the minima compare. OR ◦ Explanations of how the two functions compare with no references to their values.
Correct Answer	<p>Part B</p> <p>The minimum of $f(x)$ is $(-1, -3)$ and is located below the minimum of $g(x)$ which is $(1, 2)$.</p> <p>The width of $f(x)$ is represented by the value of 2, and the width of $g(x)$ is represented by the value of 1. Function $g(x)$ is wider than $f(x)$ because the lesser the value of a the wider the shape of the parabola.</p>

Part B #3

Rubric

Score Point 4	Student scores 4 points.
Score Point 3	Student scores 3 or 3.5 points.
Score Point 2	Student scores 2 or 2.5 points.
Score Point 1	Student scores 0.5, 1, or 1.5 points. OR Student demonstrates a minimal understanding of identifying zeros and extreme values of the graph within the context of a quadratic function.
Score Point 0	Student response is insufficient to demonstrate a grade-appropriate, relevant understanding of the task.
Score Points	<p>Part A</p> <ul style="list-style-type: none"> • Score 2 points: <ul style="list-style-type: none"> ○ Correct answers with a complete explanation or work provided. • Score 1.5 points: <ul style="list-style-type: none"> ○ Correct answers with a partial explanation or work provided. • Score 1 point: <ul style="list-style-type: none"> ○ Correct answers with no work or explanation provided. OR ○ One correct answer with valid work or explanation provided. • Score 0.5 point: <ul style="list-style-type: none"> ○ Demonstrates a minimal understanding of the extreme value of the graph within the context of a quadratic function. <p>Part B</p> <ul style="list-style-type: none"> • Score 2 points: <ul style="list-style-type: none"> ○ Correct answers with a complete explanation or work provided. • Score 1.5 points: <ul style="list-style-type: none"> ○ Correct answers with a partial explanation or work provided. • Score 1 point: <ul style="list-style-type: none"> ○ Correct answers with no work or explanation provided. OR ○ Incomplete explanation with zeros identified without specifying the meaning of the zeros. • Score 0.5 point: <ul style="list-style-type: none"> ○ Demonstrates a minimal understanding of identifying zeros of the graph within the context of a quadratic function.
Correct Answer	<p>Part A</p> <p>The maximum value of $P(x)$ is the vertex located at (3, 225) on its graph. The point represents the price that would yield the maximum weekly profit.</p> <p>The price of \$3 will yield a maximum weekly profit of \$225.</p> <p>Part B</p> <p>The prices that would make the weekly profit \$0 are \$0 and \$6 because the zeros of the function are:</p> $0 = -25x^2 + 150x$ $0 = -25x(x - 6)$ $0 = -25x \text{ and } 0 = x - 6$ $0 = x \text{ and } 6 = x$

Part B #6

Rubric

Score Point 2	Student demonstrates a complete understanding of calculating and interpreting the average rate of change of a function presented as a table over a specified interval.
Score Point 1	Student demonstrates a partial understanding of calculating and interpreting the average rate of change of a function presented as a table over a specified interval.
Score Point 0	Student response is insufficient to demonstrate a grade-appropriate, relevant understanding of the task.
Score Points	<ul style="list-style-type: none"> • Score 2 points: <ul style="list-style-type: none"> ○ Correct value and interpretation. • Score 1 point: <ul style="list-style-type: none"> ○ Correct value. OR ○ Correct interpretation.
Correct Answer	<p>The average rate of change is $\frac{2}{7}$. The plant's height increases at an average rate of $\frac{2}{7}$ centimeters per day.</p> <p>NOTE: Other reasonable interpretations of the average rate of change are acceptable.</p>