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.	**D**	KY.HS.F.4.a	MP.4, MP.5
3.	See rubric	KY.HS.F.7.a	MP.4, MP.5
4.	**C**	KY.HS.A.25.b	MP.6
5.	See rubric	KY.HS.F.1.e	MP.1

Part B

Item Number	Answer Key	Kentucky Academic Standard	Mathematical Practices
1.	**B**	KY.HS.F.1.e	MP.1
2.	**C, E**	KY.HS.G.6	MP.1
3.	See rubric	KY.HS.F.5.a	MP.2

4.	**C**	KY.HS.SP.8.a	MP.5
5.	**C**	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	• Score 2 points: ○ Correct formula with a complete explanation. • Score 1 point: ○ 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	The sequence increases by 3 from one term to the next. I determined this by finding the rate of change. $\frac{23-2}{8-1}=\frac{21}{7}=3$ Then I used the formula $a_n = a_1 + (n-1)d$ to write an equation that could be used to find the *n*th term of the arithmetic sequence. The initial value, a_1, is 2. The common difference, *d*, is 3. $a_n = 2 + 3(n-1)$ Note: • Other valid explanations are acceptable. • Equivalent equations are acceptable. • Variable substitution is allowed.

Part A #5	
Rubric	
Score Point 4	Student scores 4 points.
Score Point 3	Student scores 3 points.
Score Point 2	Student scores 2 points.
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	• Score 4 points: ○ Complete explanations of how the two functions compare using their values. • Score 3 points: ○ Complete explanations of how two of the features of the functions compare with a partial explanation of how the third feature compares. **OR** ○ Values of all three features of the functions with partial explanations. • Score 2 points: ○ Partial explanation of how two of the features of the functions compare with no values given. **OR** ○ Values of only three of the features of the functions with no explanation. • Score 1 point: ○ Partial explanation of how only one of the features of the functions compare with no values given. **OR** ○ Values of only one of the features of the functions given.
Correct Answer	The *y*-intercept of $\boldsymbol{f(x)}$, $\boldsymbol{f(0)=\overline{1}}$, is less than the *y*-intercept of $\boldsymbol{g(x)}$, $\boldsymbol{g(0)=3}$. The minimum of $\boldsymbol{f(x)}$ is $(\bar{1}, \bar{3})$ and is located below the minimum of $\boldsymbol{g(x)}$, which is $(1, 2)$. The width of $\boldsymbol{f(x)}$ is represented by the value 2, and the width of $\boldsymbol{g(x)}$ is represented by the value of 1. Function $\boldsymbol{g(x)}$ is wider than $\boldsymbol{f(x)}$ because the lesser the value of $\boldsymbol{a}$ the wider the shape of the parabola.

Part B #3	
Rubric	
Score Point 4	Student scores 4 points.
Score Point 3	Student scores 3 points.
Score Point 2	Student scores 2 points.
Score Point 1	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	**Part A** • Score 2 points: ○ Correct answers with a complete explanation or work provided. • Score 1 point: ○ Correct answers with no work or explanation provided. **OR** ○ One correct answer with valid work or explanation provided. **Part B** • Score 2 points: ○ Correct answers with a complete explanation or work provided. • Score 1 point: ○ Correct answers with no work or explanation provided. **OR** ○ Incomplete explanation with zeros identified without specifying the meaning of the zeros.
Correct Answer	**Part A** 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. The price of $3 will yield a maximum weekly profit of $225. **Part B** The prices that would make the weekly profit $0 are $0 and $6 because the zeros of the function are: $0 = -25x^2 + 150x$ $0 = -25x(x - 6)$ $0 = -25x$ and $0 = x - 6$ $0 = x$ 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	• Score 2 points: ○ Correct value and interpretation. • Score 1 point: ○ Correct value. **OR** ○ Correct interpretation.
Correct Answer	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. NOTE: Other reasonable interpretations of the average rate of change are acceptable.