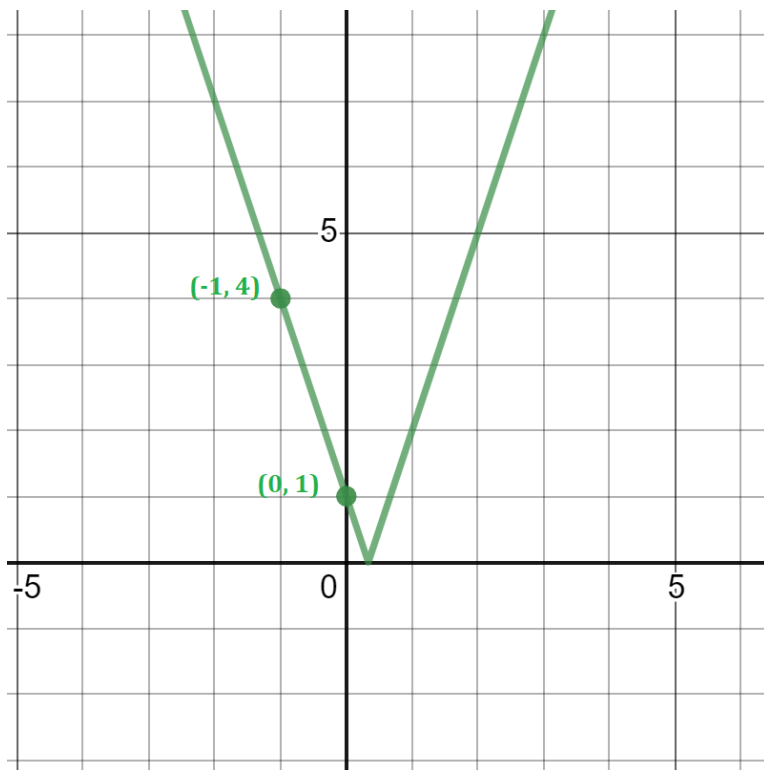


Summer 2020 MATH 115 Quiz 2 - SHOW ALL WORK!

1. 3 pts. Solve $|7 - 5x| \geq 11$. Use interval notation and exact values in your answer.

2. 3 pts. Find the absolute value function whose graph is pictured below. Use exact values.



3. 3 pts. According to the Bureau of Labor Statistics, the average price of a pound of tomatoes in September of each year is given below:

	year	Avg. Price in dollars
2010 Sept	1	1.503
2011 Sept	2	1.503
2012 Sept	3	1.384
2013 Sept	4	1.566
2014 Sept	5	1.546
2015 Sept	6	1.775
2016 Sept	7	1.786
2017 Sept	8	1.828
2018 Sept	9	1.826
2019 Sept	10	1.911

A. Find the least squares regression line for these data. You can use least squares regression functionality on a calculator or use Excel to determine the line. (In Excel, if you do a scatter plot of the points, you can just add the linear trendline to the plot, which will be the least squares regression line. You can also use Desmos. Just click on Help and Desmos will walk you through it.) For the years (x values) in each data point, use the integers 1,2,3,4,.... and not the actual years of 2010, 2011, 2012 Round answers to 3 decimal places. Your answer here should be an equation of a line in the form $y = mx + b$.

B. Use this least squares regression line model (the equation from part A) to predict what the average price of a pound of tomatoes will be in September 2030. Your answer needs to be accurate to three decimal places.

C. This least squares regression line model predicts that the average price will first be more than \$3.25 per pound in September of what year?

4. 9 pts. For the function $f(x) = -\frac{1}{2}x^2 + 5x - 6$, find the following. Use **exact values** and **interval notation** (wherever an interval is an appropriate answer.)

A. 2 pts. Put $f(x)$ into the standard form of a quadratic function by completing the square. (See the definition of standard form on page 190 of section 2.3 of the textbook.)

B. 1 pt. Find the vertex.

C. 2 pts. Find (and simplify) the x intercept(s).

D. 1 pt. Find the interval(s) on which the function is decreasing.

E. 3 pts. Solve $f(x) \leq -6$. Show your work on how you arrive at your answer! Use interval notation.

5. 3 pts. Solve $\frac{2x}{5} - \frac{10}{x} = 2x$ finding all the solutions, real or complex. Find exact solutions.

6. 9 pts. For the function $g(x) = 3(2x + 3)(2x - 1)^3(6 - x)$, find the following using exact values, and interval notation (wherever an interval is an appropriate answer.) Note that there is no need to multiply everything out in order to do this problem.

A. 1 pt. Find the degree of the polynomial function.

B. 1 pt. Find the leading term.

C. 2 pts. Find the x and y intercepts.

D. 2 pts. Find the end behavior of the polynomial function.

E. 3 pts. Solve $g(x) \leq 0$. Use interval notation.