

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 5 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test. Don't give the impression that you are cheating.
- ❖ Be sure to write neatly and in pencil. If I cannot read what was written, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

Good luck!

Number	Maximum	Score
1	4	
2	4	
3	4	
4	9	
5	18	
6	3	
7	9	
8	6	
9	18	
10	9	
11	4	
12	3	
13	9	
Total	100	

Name _____

circle final answers

1) (2 points each) Short answer:

a) What makes a relation a function?

b) So far in this class, we've discussed two things you cannot do with real numbers? What are they?

2) (2 points each) Find the domain of the following functions:

a) $f(x) = 5x^3 - 5x^2 + x - 1$

b) $g(x) = \frac{2x + 3}{2x^2 - 18}$

3) (4 points) For the function $f(x) = 2x^2 - 6x + 5$, find and simplify $\frac{f(x+h) - f(x)}{h}$:

4) (3 points each) Mary buys a Cricut cutting machine and other supplies for \$657 and plans to make custom aprons to sell with the machine. Each apron costs \$12.50 to make and she plans to sell them for \$30.75 each.

a) Write and label the corresponding Revenue, Cost, and Profit functions for this problem:

b) How many aprons must be sold to break even?

c) If she sells 5 aprons a week, **during** which week will she be able to break even?

5) (3 points each) It was found that the price and demand for *A Taco's Adventure Deluxe Edition* video game can be given by $p = D(q) = 663 - 0.55q$ where p is price in dollars and q is the demand in hundreds of copies of the game. Suppose that the price and supply (in hundreds of copies of the game) is given by $p = S(q) = 2.05q$. Rounding answer to the nearest whole number as needed...

a) Find and interpret, using the language of the problem, the following.

i) $D(200)$

ii) $S(400)$

b) Find the demand when the price is \$300:

c) Find the supply when the price is \$300:

d) Based on your work in parts *b* and *c* above, will there be a surplus or shortage when the price is \$300? Explain your answer.

e) Find the equilibrium quantity and equilibrium price:

6) (1 points each) Short answer: In your own words, describe the formula for the...

a) Cost Function:

b) Revenue Function:

c) Profit Function:

7) (3 points each) Jo Jo Ba decided to drop the javelin and start launching pumpkins that she found on her neighbors' front porch. Throwing the pumpkins from a 50-foot cliff, the height of the pumpkin h , in feet, can be given by the function $h(t) = -16t^2 + 57.6t + 50$ where t is time in seconds. Determine the following:

a) At what time is the pumpkin the highest off of the ground?

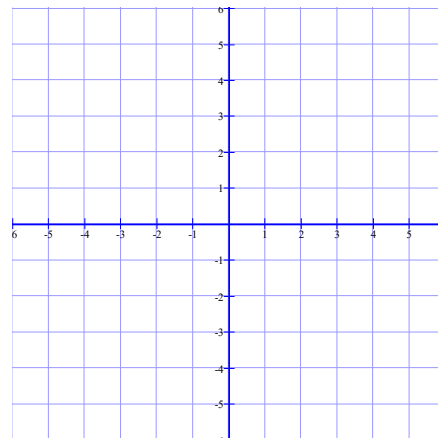
b) What is the highest height the pumpkin reaches?

c) When does the pumpkin hit the ground?

8) (3 points each) For the function $f(x) = -2(x+4)^2 + 5 \dots$

a) List the steps needed to sketch a graph:

b) Sketch a graph. Be sure to label the asymptotes.



9) (3 points each) For the function $f(x) = 2x^2 - 9x - 5$, determine the following:

a) The domain

b) Whether it opens up or down

c) The vertex

d) The range

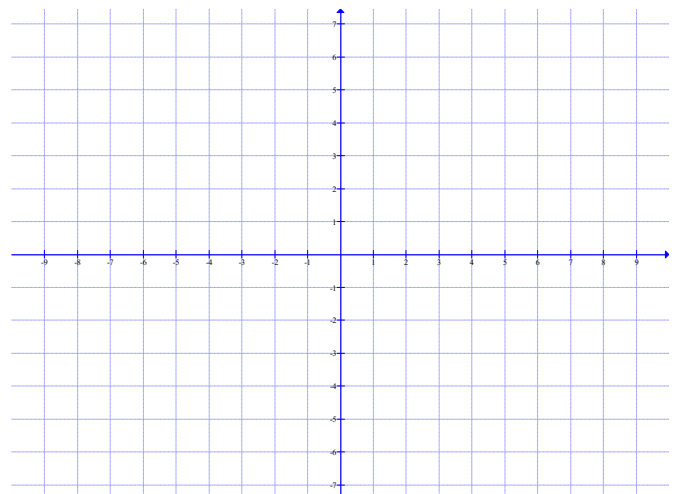
e) The x -intercept(s)

f) The y -intercept

10) (3 points each) For the function $f(x) = -3x^4 + 12x^2 \dots$

a) Find the leading term and state which quadrants the arrowheads will be in and why:

c) Sketch the graph based on parts a and b :



b) Fill in the chart:

Zero	Multiplicity	Touch/Cross

