

READ THESE DIRECTIONS BEFORE STARTING

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 6 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 me 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	3	
2	2	
3	9	
4	4	
5	2	
6	5	
7	12	
8	12	
9	5	
10	12	
11	6	
12	2	
13	8	
14	8	
15	10	
Total	100	

Name \_\_\_\_\_

Circle final answers

1) (3 points) Find the equation of the circle in standard form where the points  $(7,6)$  and  $(-5,1)$  are endpoints to a diameter of the circle

2) (2 points) What is a function?

3) (3 points each) Find the domain of the following functions:

a)  $f(x) = x^2 + 13x + 12$

b)  $g(x) = \frac{2x + 5}{2x^2 - 3x - 14}$

c)  $h(x) = \frac{-4x + 4}{\sqrt{9x + 3}}$

4) (4 points) In class we discussed two of the three things you cannot do with real numbers. What were they and how do they help you find the domain of a function? Do not use examples in your answer.

5) (2 points) Find the equation of the line in slope-intercept form that passes through the points  $(10,6)$  and  $(-2,7)$ .

- 6) (5 points) The function  $f(x) = -x^2 + 15x + 20$  approximates the number of new words learned by a student in an Pig Latin 101 class where  $x$  is the number of weeks since the beginning of the semester. Find and interpret the average rate of change from  $x = 2$  to  $x = 8$ .

- 7) (3 points each) The percent of cell phone users that use the Facebook app is given below:

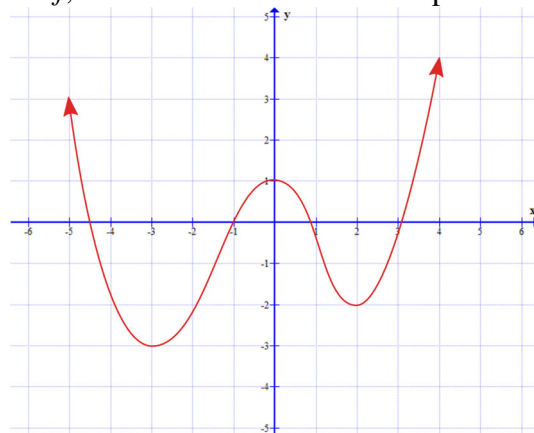
Month (during the year 2015)	May	June	July	August	September	October	November
Percent	70.2	71.8	73.3	75.4	76.2	77.3	77.2

Let  $x$  represent the number of months since **December 2014** and let  $y$  represent the percent of Facebook app users.

- a) Find the equation of the regression line. Round values to two decimal places:
- b) Interpret the slope and y-intercept using the language of the problem:
- c) During what month and year will the percent of Facebook app users hit 79%?
- d) Predict the percent number of app users in October 2016.

- 8) (2 points each) For the given graph, find the following. Write parts  $a - d$  in interval notation. For parts  $c$  and  $d$ , write in terms of  $x$ . For parts  $e$  and  $f$ , write answer as an ordered pair.

- a) The Domain                      b) The Range
- c) Increases                        d) Decreases
- e) Relative Maxima                f) Relative Minima





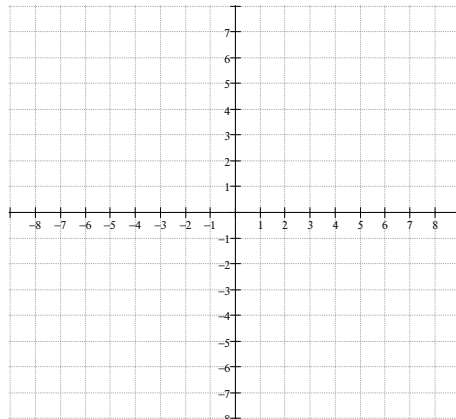
13) (2 points each) The ordered pair  $(1, -6)$  is on the graph of  $y = f(x)$ . Find the corresponding ordered pair on the graph of  $y = g(x)$  where...

- a)  $g(x) = f(x) - 3$       b)  $g(x) = \frac{2}{3}f(x)$       c)  $g(x) = f(x - 4)$       d)  $g(x) = f(-x)$

14) (4 points each) For the function  $f(x) = \frac{-1}{x+3} + 2 \dots$

a) Explain, in order, the steps needed to sketch the graph:

b) Sketch and label the graph:



15) (1 point each) Match the following functions with the best description or picture:

\_\_\_\_\_ Constant

\_\_\_\_\_ Linear

\_\_\_\_\_ Identity

\_\_\_\_\_ Cube

\_\_\_\_\_ Square

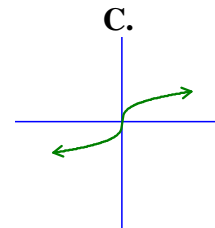
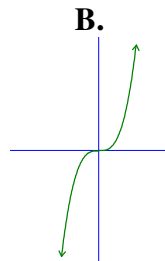
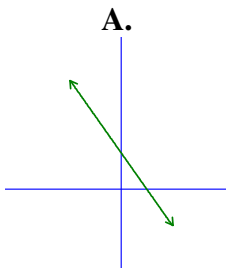
\_\_\_\_\_ Square root

\_\_\_\_\_ Cube root

\_\_\_\_\_ Reciprocal

\_\_\_\_\_ Piecewise-defined

\_\_\_\_\_ Absolute value



**D.** The graph bisects the first and third quadrants

**E.** Same  $y$ -value for all  $x$  values

**F.** The graph is a U-shaped curve

**G.** Has vertical and horizontal asymptotes at the  $x$ - and  $y$ -axis

**H.** The graph is a V-shaped curve

**I.** The graph is half of a parabola

**J.** Made up of other functions