

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 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	6	
2	4	
3	2	
4	9	
5	5	
6	12	
7	12	
8	6	
9	6	
10	3	
11	6	
12	4	
13	6	
14	8	
15	11	
Total	100	

Name _____

CIRCLE FINAL ANSWERS

1) (2 points each) For the given points $(6, -2)$ and $(1, 10)$, find...

a) The distance between them:

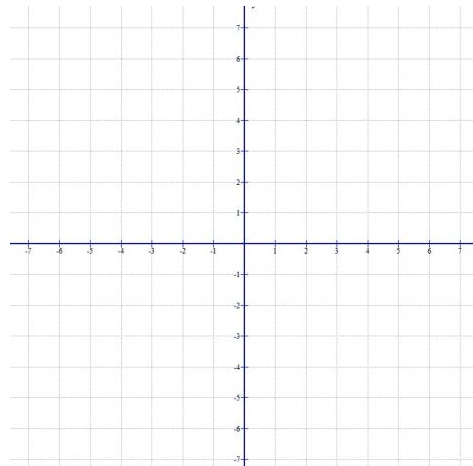
b) Their midpoint:

c) Find the equation of the circle where $(6, -2)$ and $(1, 10)$ are endpoints of a diameter of the circle:

2) (2 points each) For the circle $(x + 2)^2 + (y - 3)^2 = 9 \dots$

a) Find the center and radius:

b) Sketch a graph:



3) (2 points) Find the equation of a line in slope-intercept form that passes through the point $(1, -5)$ and is perpendicular to $4x - 9y = 12$:

4) (3 points each) Find the domain of the following functions:

a) $f(x) = 6x^3 + 6x^2 - 4x - 4$

b) $g(x) = \frac{x^2 + 9}{x^2 - 9}$

c) $h(x) = \frac{-12}{\sqrt{3x-1}}$

5) (5 points) It was found that the profit P from selling x tickets of *The Mythically Nice Professor* can be modeled by the function $P(x) = -2x^2 + 80x + 15$ where P is in dollars. Find and interpret the average rate of change from the 8th to the 16th ticket sold.

6) (3 points each) Consider the following data (source: Census.gov):

Year	2000	2005	2006	2007	2008	2009	2010	2014	2015
Population of Cleveland, Ohio (in thousands)	476	449	442	438	434	431	396	390	386

Let x be the number of years since 2000 and let y be the population of Cleveland, Ohio (in thousands).

a) Using the LinReg function on your calculator, 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) Predict the population of Cleveland in 2020:

d) During what year will there be 250,000 people in Cleveland?

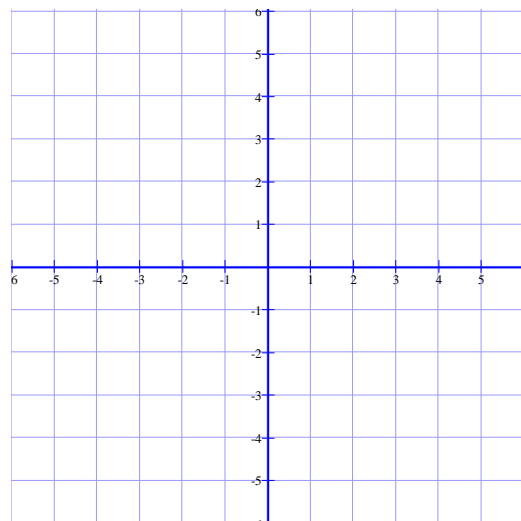
11) (6 points) For the function $f(x) = 4x^2 - 6x + 5$, find and simplify $\frac{f(x+h) - f(x)}{h}$:

12) (4 points) Determine if the function $f(x) = \frac{|x| - 2}{x^2}$ is even, odd, or neither algebraically:

13) (3 points each) For the function $f(x) = \frac{4}{x-3} + 2 \dots$

a) List the steps needed to sketch a graph:

b) Sketch a graph:



14) (2 points each) Given the point $(-9, 3)$ on the graph of $y = f(x)$, find the **exact value** of the coordinates of the point under the transformation below:

- a) $y = f(x) + 7$ b) $y = f(x + 1)$ c) $y = f(-x)$ d) $y = 3f(x) - 2$

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

_____ Constant

_____ Linear

_____ Identity

_____ Cube

_____ Square

_____ Square root

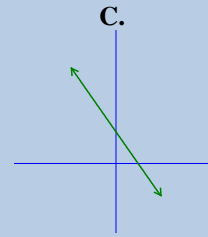
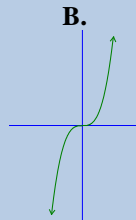
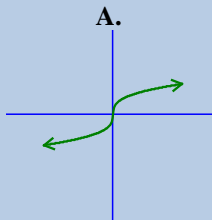
_____ Cube root

_____ Greatest-integer

_____ Reciprocal

_____ Absolute value

_____ Piecewise-defined



D.

The graph is V-shaped

E.

Also called the step function

F.

The domain and range do not include zero

G.

The range is one number

H.

The graph is called a "parabola"

I.

Made up of other functions

J.

The graph is half of a parabola

K.

Bisects the first and third quadrant