Math 107 Exam #2
April 2, 2014

Time: 1 hour and 25 minutes
Instructions: Show all work for full credit. No outside materials or calculators allowed.
Extra Space: Use the backs of each sheet for extra space. Clearly label when doing so.

Name: _____

ID #: _____

Instructor/Section: _____

"I pledge by my honor that I have abided by the NJIT Academic Integrity Code."

_____ (Signature)

Problem(s)	Score	Total

1. Evaluate. **(12 points)**:

a. $\log_4 16 =$ ___

b. $\log_5 125 =$ ___

c. $\ln e =$ ____

d. $\log 1 =$ ___

2. **(6 points)**

a. If the point (0,-5) is shifted 3 units to the left and 2 units up what are the new coordinates?

2a)_____

b. Find the distance from (2,10) to (10,2).

2b)_____

c. Find the midpoint between (2,10) and (10,2).

2c)_____

3. Let $\log_a 7 = 1.5$ and $\log_a 5 = 1.2$. Evaluate each of the following: **(6 points)**

a) $\log_a 35$

3a) _____

b) $\log_a 49$

3b) _____

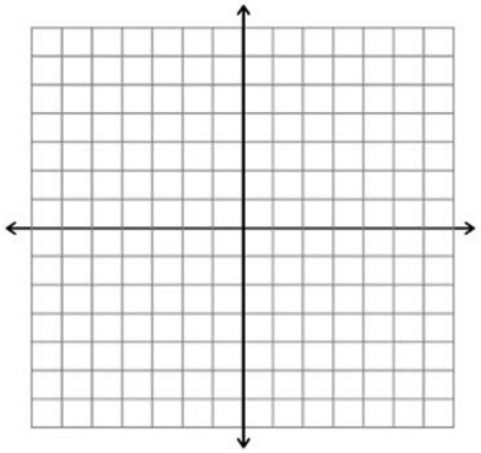
c) $\log_a \sqrt[3]{5}$

3c) _____

4. Write an equation for the function described by the given characteristics. Then graph the function. **(12 points)**

a) The shape of $f(x) = x^2$, but shifted 2 units left and 4 units down.

Equation:_____



5. Find the **equation of the line** with the given conditions.
(9 points)

5a) The slope is 3 and contains the point (-2,3)

5a)_____

5b) Parallel to the line $x=5$ and contains the point (4,2)

5b)_____

5c) Contains the points (-3,4) and (2,5)

5c)_____

6. Tell whether i) it is a polynomial function and ii) if it is an polynomial tell the degree of the polynomial: **(8 points)**

6a) $f(x)=14x-\frac{1}{2}x^5$

i)_____

ii)_____

6b) $h(x)=6$

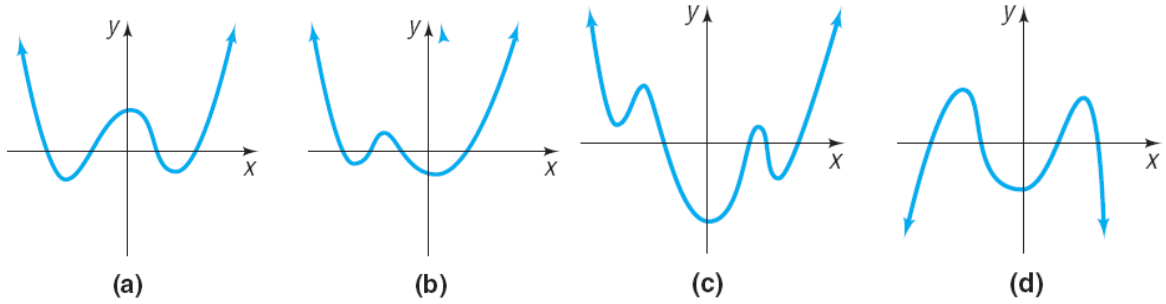
i)_____

ii)_____

7. A total of $10,000 is invested at an annual interest rate of 2%, compounded annually. **Set up** the equation to find the amount in the account after 2 years. **You do not need to solve the equation**. Hint: $A=P\left(1+\frac{r}{n}\right)^{nt}$ **(6 points)**

7)_____

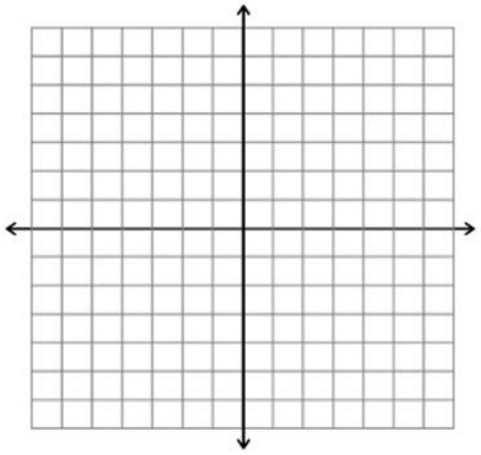
8. Which of the graphs **could** be the graph of $f(x)=x^4+5x^3-5x+6$ **(6 points)**



8)_____

9. Describe the end behavior of the following polynomial. Then sketch the graph. **(10 points)**

$$f(x) = 2x^2 + 8x + 2$$

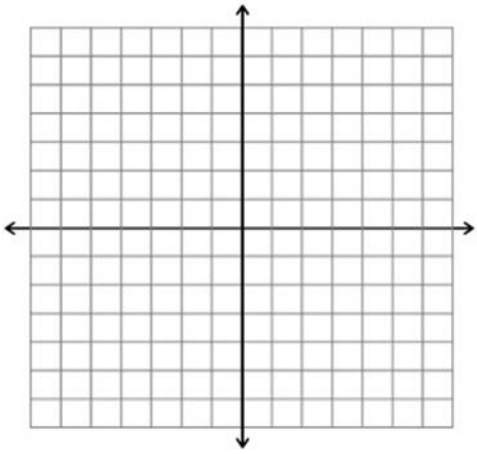


$x \to$ _____, $y = P(x) \to$ _____

$x \to$ _____, $y = P(x) \to$ _____

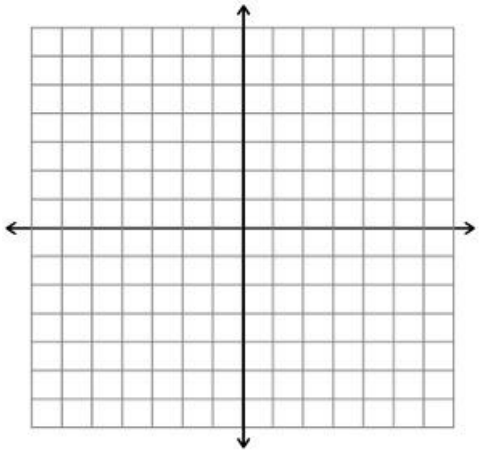
10. Find the standard form of the equation of the circle that satisfies the given conditions. Then graph the circle. **(10 points)**

a) Center (3,-2) passing through the point (-1,1)



10a)_____

b) Center at the origin and radius is 4.



10b)_____

11. Solve. **(9 points)**

a) $2^{x} = 4^{2x+1}$

11a)_____

b) $e^{-x^2} = e^{-3x-4}$

11b)_____

c) $3\left(2^{x}\right) = 42$

11c)_____

12. **(6 points)** Starting with the function $y = e^x$:

a. Describe in words the sequence of transformations that results in the graph of $y = 2e^{3x-1} - 3$
b. Find the range of the function in part a.
c. Find the horizontal asymptote for the function in part a.

a)_____

b)_____

c)_____