Test #3

Name: _____

Math 71B, Prof. Beydler

Thursday, May 22, 2014

Directions: Show all work. No books or notes. A **scientific calculator** is allowed. Your desk and lap must be clear (no phones, notebooks, etc.). Please box your answers. Good luck!

> Calculate
> Total points

1. (4 points) Solve.

$$\log_2(x - 1) + \log_2(x + 1) = 3$$

2. (4 points) Suppose $A = 4.1e^{0.01t}$ represents the population in New Zealand (in millions) t years after 2006.

What was the population of New Zealand in 2006?

What is New Zealand's growth rate?

When will New Zealand's population be 8 million?

3. (2 points) Find the distance between the following pair of points. Simplify any radicals.
$(-4, -1)$ and $(2, -3)$

4. (2 points) Find the midpoint of the line segment with the given endpoints.
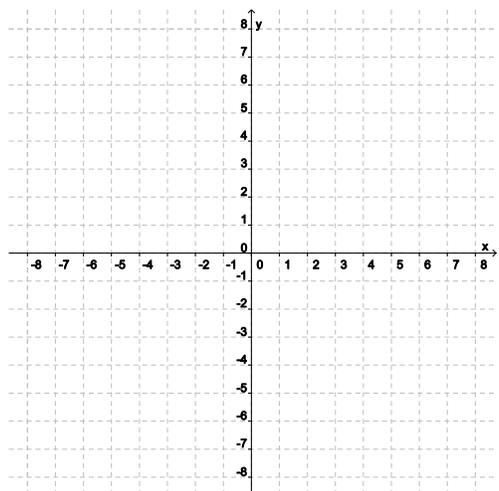$(-4, -1)$ and $(2, -3)$

5. (5 points) Complete the square and write the equation in standard form. Then give the center and radius of the circle and graph the equation.
$x^2 + y^2 + 8x + 4y + 16 = 0$
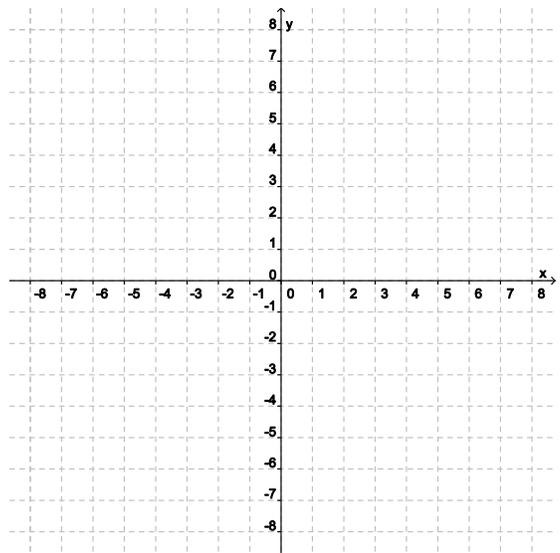
6. (2 points) Identify the following conic section and graph.

$$\frac{(x-3)^2}{9} + \frac{(y+1)^2}{16} = 1$$
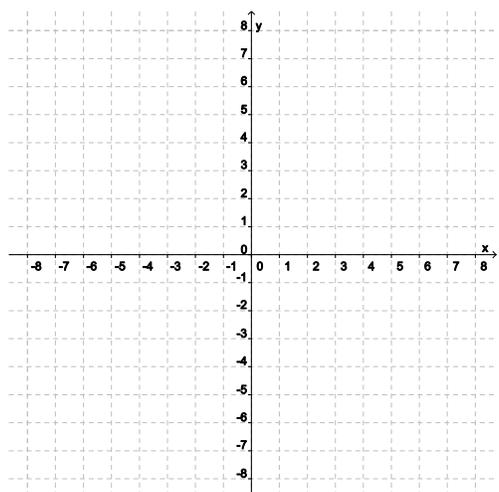
parabola   circle   ellipse   hyperbola   (circle one)
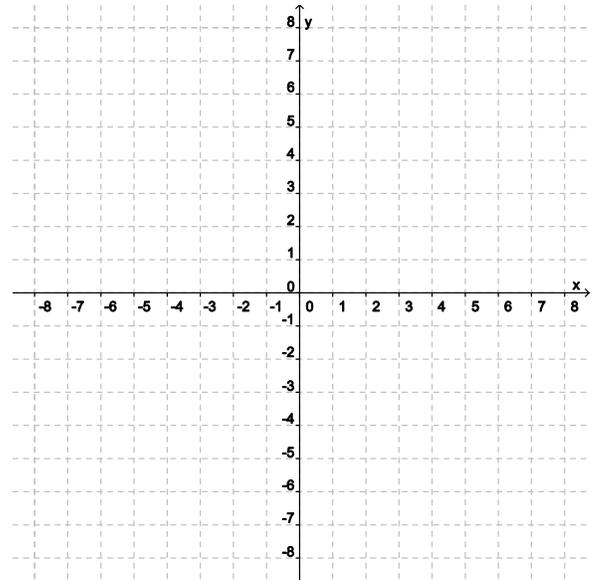

7. (2 points) Identify the following conic section and graph.

$$16x^2 - 9y^2 = 144$$

parabola   circle   ellipse   hyperbola   (circle one)

8. (5 points) Consider the parabola $x = -y^2 - 2y + 3$. Find the vertex, x-intercept, and y-intercepts. Then graph it.

9. (4 points) Solve the system by the substitution method.
$x^2 + y^2 = 5$
$3x - y = 5$

10. (2 points) Write the first three terms of each sequence.

$a_n = \dfrac{(n+1)!}{n^2}$

11. (2 points) Find each sum.

$\displaystyle\sum_{k=2}^{4}(k-3)(k+2)$

12. (2 points) Express each sum using summation notation. Use 1 as the lower limit of summation and i for the index of summation.

$\dfrac{1}{9} + \dfrac{2}{9^2} + \dfrac{3}{9^3} + \cdots + \dfrac{n}{9^n}$

13. (4 points) Expand $(x - 3y)^5$

14. (3 points) Find the sixth term in the expansion of $(x^3 + y^2)^8$

15. (3 points) Solve.
$\log(x + 4) = \log x + \log 4$

Note: Be sure to double check your work. And don't forget to turn in your homework! ☺