Name: _____

Recitation Instructor and Time: _____

Studio College Algebra – Exam 3
April 7, 2009

1. Rewrite the formula $y^3 = \frac{z}{7}$ by taking the logarithm of both sides.

2. Rewrite the formula $y = 59x^{3.2}$ by taking the logarithm of both sides.

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3. If $\log(a) = 2.3$ and $\log(b) = 4.2$, what is $\log\left(\frac{\sqrt[3]{b}}{a}\right)$?

4. Solve $2^x - 1 = 4$

5. Solve $\ln(x-6) + 11 = 13$.

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6. What is the future value, in 5 years, of an initial investment of $12,000 at an annual interest rate of 6%, compounded monthly?

7. The value V of an initial investment of $3000 compounded continuously at a 4% rate of return is given by the function $V(t) = 3000e^{.04t}$, where t is the time in years from the initial investment. Approximately how many years would it take for this investment to grow to a value of $30,000?

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8. The revenue function for the sale of a certain product is given by $R(x) = -x^3 + 86x^2 - 700x$, where x is the number of units sold. If the sale of 70 units leads to \$29,400 in revenue, what is another number of units that leads to the same amount of revenue?

9. Find 2 possible 4th degree polynomials with single roots at $x = -1$ and $x = 5$, and a double root at $x = 4$. Write the polynomials in standard form $a_n x^n + ... + a_1 x + a_0$.

Answer 1: _____

Answer 2: _____

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10. Given that $x = 4$ and $x = -4$ are roots of the polynomial $P(x) = 2x^4 + 11x^3 - 53x^2 - 176x + 336$, find all other roots, both real and complex, of *P(x).*

11. Let $R(x) = x^3 + 2x^2 - 13x + 10$. Is $x - 2$ a factor of *R(x)*? How do you know?

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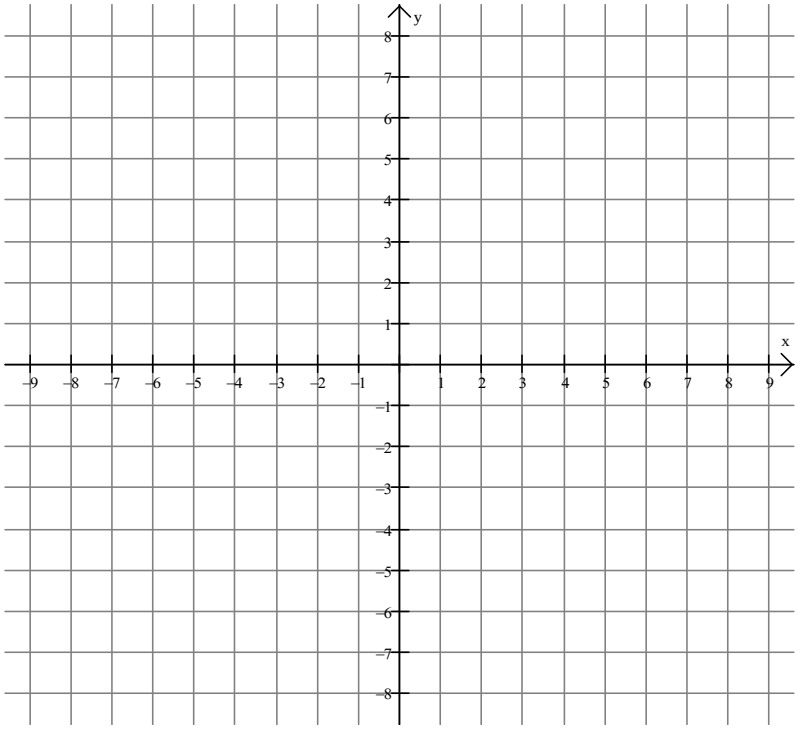
12. The profit function for a certain product is given by $P(x) = 1660x - x^3$, where x is the number of units sold. What values of x result in zero profit?

13. Sketch a polynomial on the grid below with the given characteristics:

a) Even degree
b) Positive leading coefficient
c) Positive constant term
d) A repeated root at $x = 3$
e) A repeated root at $x = -5$



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14. What is the horizontal asymptote of the function $f(x) = 5^x + 10$? Explain how you arrived at your answer.

15. What is the domain of the function $D(x) = 25\log(x - 16)$?

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16. The volume of a box can be described by the formula $V(x) = 256x - 64x^2 + 4x^3$, where x is the height of the box in inches.

a) Find all the roots of *V(x)*. Are any of the roots repeated roots?

b) What is *V(4)?*