Name _____

Math 111 Section 4
(Quiz 7 over sections 4.5 – 5.2)

The first sixteen problems are worth ½ point apiece.

Evaluate the expression (example: leave 8 not 2^3)

1. a. $4^{-3} * 4^5$ b. $3^{-3} * 3^6$

answers: 1. a. _____ b. _____

2. a. $9\,(9)^{-1/2}$ b. $5(5)^{-1/2}$

answers: 2. a. _____ b. _____

Simplify the equation for x:

3. a. $(64\,x^{9})^{1/3}$ b. $(25\,x^3\,y^4)^{1/2}$

Answers: 3. a. _____ b. _____

4. a. $\dfrac{6a^{-4}}{3a^{-3}}$ b. $\dfrac{4b^{-4}}{12b^{-6}}$

Answers: 4. a. _____ b. _____

Problems 5-8 Solve the equation for x.

5. $6^{2x} = 6^6$

Answer: 5. _____

Still solving the equation for x problems 6-8.

6. $3^{3x-4} = 3^5$

Answer(s): 6. _____

7. $3^{2x} - 12 * 3^x + 27 = 0$

Answer(s): 7. _____

8. $2^{2x} - 4 * 2^x + 4 = 0$

Answer(s): 8. _____

Express each equation in logarithmic form.

9. $2^6 = 64$

Answer: 9. _____

10. $4^{-2} = \dfrac{1}{16}$

Answer: 10. _____

11. $3^5 = 243$

Answer: 11. _____

Cont. expressing in logarithmic form.

12. $81^{3/4} = 27$

Answer: 12. _____

Given that $\log 3 \approx 0.4771$ and $\log 4 \approx 0.6021$ find the value of the logarithm.

13. $\log \frac{1}{300}$

Answer: 13. _____

Write the expression as the logarithm of a single quantity.

14. $\frac{1}{2} \ln x + 2 \ln y - 3 \ln z$

Answer: 14. _____

Use the laws of logarithms to expand and simplify the expression.

15. $\log \frac{\sqrt{x+1}}{x^2+1}$

Answer: 15. _____

Use logarithms to solve the equation for t.

16. $5 e^{-2t} = 6$

Answer: 16. _____

The final two are worth a point apiece.

Your choice: Do number 17 or 18 worth 2 points. Only do <u>one</u> of these and <u>cross out</u> the one I don't grade.

17. Packaging **By cutting away identical squares from each corner of a rectangular piece of cardboard and folding up the resulting flaps, an open box may be made. If the cardboard is 15 in. long and 8 in. wide, find the dimensions of the box that will yield the maximum volume.**

Answer: 17. _____

18. Minimizing Costs **A pencil cup with a capacity of 36 in.^{3} is to be constructed in the shape of a rectangular box with a square base and an open top. If the material for the sides costs 15¢ / in^2 and the material for the base cost 40 ¢ / in.^{2}, what should the dimensions of the cup be to minimize the construction cost?**

Answer: 18. _____