Math-3 Name_____ ID: 1

SM3 HW #5-8 (Unit 5 Test Preview HW)

Date_____ Period____

Write each expression in exponential form.

1) $\sqrt[3]{3m^2}$

Simplify.

2) $x^{\frac{1}{3}}y^2 \cdot 2x^{\frac{2}{3}}y^{-\frac{1}{2}}$

3) $\sqrt{3}\left(4 - 4\sqrt{3}\right)$

4) a) Write the vertex form equation. (Show all of your work.)
b) Find the zeroes of the equation.

$y = x^2 - 8x + 1$

5) Write an equation of a line through:
$(4, -1)$ and $(-3, 4)$

6) Simplify
$\frac{3a}{4a} - \frac{3a}{4ab}$

7) Simplify
$\frac{\frac{16}{5x}}{\frac{x}{25}}$

8) 12 qt. of a 28% acid solution was mixed with 6 qt. of a 58% acid solution. Find the concentration of the new mixture.

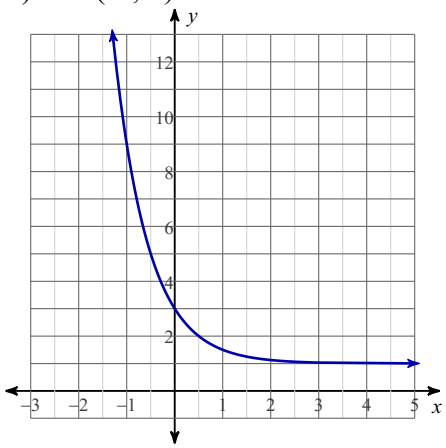
9) $f(x) = \frac{3x + 1}{x - 2}$

a) Wrtie the equation as the reciprocal function.
b) Vertical Asymptote?
c) Horizontal Asymptote?
d) x-intercept?
e) y-intercept?

10) $g(x) = \frac{2x}{x + 3} + 1$

$g^{-1}(x) = ?$

11) Write the eqaution for the graph. The graph passes through the ordered pairs (0, 3) and (-1, 9)



12) Solve:

$$\frac{1}{x} - \frac{x-6}{x} = 4$$

13) a) Describe the transformation of the parent function $y = \left(\frac{1}{4}\right)^x$ given by the equaiton

g(x)= $3 \cdot 2^x - 4$

b) what is the horizontal asymptote?

c) what is the domain?

d) what is the range?

e) What is the "growth factor"?

f) what is the y-intercept?

g) is the function "growth" or "decay"?

14) Solve. Show either your table or a graph with signs (+/-), then write the solution in interval notation:

$$-3x^2(x-1)(x+3)(x-4) < 0$$

a) Identify the domain
b) Identify the range.
c) Vertical Asymptote
d) Describe how it is a tranformation of its parent function.

15) $y = 3\log_5 (x - 2) + 4$

Find the inverse of each function.

16) $y = \log_3 x^4$

17) $y = 5^x - 8$

Expand each logarithm.

18) $\log_4 \frac{x}{y^2}$

19) $\log_3 \left(z^2\sqrt{x \cdot y}\right)$

Condense each expression to a single logarithm.

20) $\log_7 x - \log_7 y$

21) $\log_9 u + 5\log_9 v$

Identify the domain and range of each.

22) $y = \log_6 (2x - 1) + 5$

23) Rewrite in exponential form.
$\log_2 (2x - 3) = 4$

24) Rewrite in logarithmic form.
$3^x = 12$

Solve each equation. Remember to check for extraneous solutions.

25) $\sqrt{-1 - 2x} = x$

Solve each equation.

26) $6^{-2a} = 6^{-3a-2}$

27) $4^{x} = 64^{3x}$

Solve. Round your answers to the nearest thousandth.

28) $15^{-9r} - 5 = 92$

Solve each equation.

29) $\log\left(-7n + 2\right) = \log\left(n^2 + 2\right)$

30) $\log_2 5 - \log_2 x = 4$

31) $\log_7\left(x - 9\right) = 2$

32) Suppose that you test some juice and find that the hydrogen ion concentration is H+ = 0.00043 moles/li. Find the pH value and determine whether the juice is basic or acidic. (If pH > 7 it is basic).

33) What is the H+ concentration if the measured pH = 7.5?
Write your answer in scientific notation.

34) Find the time required for an investment of $100 to double if the money is placed in a simple interest account (compounded once per year) that earns 4.5% interest.

35) If you put $1500 into an interest bearing account that pays 2.75% interest compounded continuously, how long will it take for the money to grow to $2500?

36) The front row of a rock concert has a sound intensity of 3.5 x 10^2 watts/m^2.
How loud is the sound in decibels? (they need to turn the volume down or you will go deaf!)

37) What is the sound intensity of a hawk in flight that makes 8 dB of sound?

38) NUAMESium-19 decays to WSUim-21. The half life of NUAMESium-19 is 180 days.
Write a base 'e' exponential equation that predicts the amount of NUAMESium as a function for time. Assume the initial amount is 200.

39) Assuming the intial amount is 50, the decay equation for USUium-23 is: $A(t) = 50 \cdot 0.92^x$
Rewrite this equation as a base e exponential function.

40) A pizza was cooked in an oven at 425 degrees Fahrenheit. The pizza was removed from the oven and placed on the counter in a room that was at 75 degrees. After 10 minutes the temperature of the cake was 200 degrees.

a) Find the equation that models this situation using: $T(t) = AB^t + k$

b) Convert this equation to a base 'e' exponential equation of the form: $T(t) = Ae^{kt} + m$

c) How long will it take to cool to 105 degrees?