Math 1203 Quiz 4
February 5, 2019

Name: ANSWERS

Instructions: Answer <u>all</u> problems in the space provided! Do your rough work on scrap paper.

1. Complete the following rules:

(a) $a^x \cdot a^y =$ a^{x+y} (b) $a^{\frac{x}{y}} =$ $\sqrt[y]{a^x}$ (c) $(a^x)^y =$ a^{xy}

(d) $x^{-a} =$ $1/x^a$

2. Suppose you have a line passing through points (x_1, y_1) and (x_2, y_2). What is an equation that describes its slope?

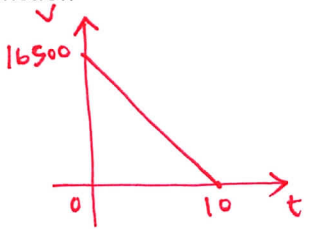
$m = \frac{y_2 - y_1}{x_2 - x_1}$

3. What is the point-slope form of the equation of a line? $y - y_1 = m(x - x_1)$

4. What is the slope intercept form for the equation of a line? $y = mx + b$

5. Describe when you should use an exponential model to describe a quantity: when the quantity is changing by a fixed relative (percentage) amount at regular intervals.

6. Jhevon decided to pay taxes on his income from his hotdog stand. He bought his stand for \$16,500, and his accountant (every hotdog vendor should have an accountant) plans to depreciate the stand, for tax purposes, to a value of \$0 over 10 years. Assuming this depreciation is linear and is described by a function $V(t)$—the value of the hotdog stand after t years from purchase,



(a) Find a formula for $V(t)$: $V(t) = 16500 - 1650t$

(b) What is the domain of $V(t)$? $[0, 10]$, specifically $t \in [0, 10]$

(c) What is the range of $V(t)$? $[0, 16500]$

(d) What does the slope of $V(t)$ represent? annual loss in value of the stand.

Write your answer to (b) and (c) above in interval notation.

Bonus:

1. Solve the following equations:

(a) $2e^{3x-1} = 5 :\Rightarrow x =$ $\frac{1 + \ln(5/2)}{3}$ (b) $\ln\sqrt{x+1} = 3 :\Rightarrow x =$ $e^6 - 1$

2. Simplify: $\ln\sqrt{\frac{3x^2e^x}{\sqrt{x}}} =$ $\frac{1}{2}\ln 3 + \ln x + \frac{1}{2}x - \frac{1}{4}\ln x$ (expand)

OR

$\frac{\ln 3}{2} + \frac{3\ln x}{4} + \frac{x}{2}$