

Math 199 Worksheet - 28/29 October 2014

Group names:

Question 1. After learning about geometric growth, the company Zom-B-Gone decides to manufacture zombie repellent, and they hire two independent firms to analyze their potential sales. Firm A predicts that if Zom-B-Gone makes x cans, their profit is given by $\log_2(4x)$. Firm B predicts that if Zom-B-Gone makes x cans, their profit is given by $\log_2(2x) + 1$. For which values of x are the predictions the same?

Question 2. The height of one spooky shadow at time x is given by $8^{\frac{x}{3}}$, while the height of another spooky shadow at time x is given by e^{2x+1} . At what time are the two shadows at the same height?

Question 3. Boxes are packed with giant mealworms. During shipping, the mealworms reproduce. If the box arrives with x mealworms, the number shipped is given by the equation:

$$\ln(2x) + \ln(5x).$$

If a box is shipped with 7 mealworms, how many are there upon arrival?

Question 4. Solve for x .

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

Question 5. Solve for x .

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

Question 6. Here's a warm-up before we make you graph some rational functions.

$$f(x) = \frac{5x(x - 2)(x - 4)^2(x - 6)}{x}$$

On the number line below, indicate where $f(x)$ is positive and where it is negative.



Question 7. Match the graphs to their equations.

(I) $\frac{(x-1)^2(x+3)}{(x+1)(x-2)}$

(II) $\frac{(x-1)(x+3)^2}{(x+1)(x-2)}$

(III) $\frac{(x-1)(x+3)}{(x+1)^2(x-2)}$

(IV) $\frac{(x-1)(x+3)}{(x+1)(x-2)^2}$

