Math 190 Quiz 4

September 22, 2014

Name: ANSWERS

Instructions: No calculators. Use your own scrap. Write your fully simplified answers in the space provided.

1. Solve the following equations for x:

   (a) $-x = \frac{5}{17} \Rightarrow x =$ $\frac{-5}{17}$ (b) $2 = 0.8 - 0.5(2x - 3) + 4x \Rightarrow x =$ $-\frac{1}{10}$

   (c) $x^2 = 36 \Rightarrow x =$ ± 6 (d) $\frac{1}{4} - \frac{1}{2}x = \frac{1}{3}x + \frac{5}{4} \Rightarrow x =$ $-6/5$

   (e) $(x-7)(x+5) = -20 \Rightarrow x =$ $-3; 5$ (f) $48x^3 = 12x^5 \Rightarrow x =$ $-2; 0; 2$

   (g) $4x^3 + 16x^2 - 9x - 36 = 0 \Rightarrow x =$ $-4; \pm\frac{3}{2}$ (h) $\frac{7}{2} - \frac{2}{x} = 1 + \frac{11}{2x} \Rightarrow x =$ 3

   (i) $\frac{x-3}{5} - \frac{x+1}{10} = -\frac{1}{10} \Rightarrow x =$ 6

2. Reduce the following rational expressions to lowest terms. Your answers should be fully factored/simplified!

   (a) $\frac{x^3-1}{x^2-1} =$ $\frac{x^2+x+1}{x+1}$ (b) $\frac{250a+100ax+10ax^2}{50a-2ax^2} =$ $\frac{5(x+5)}{5-x}$

   (c) $\frac{ad-ad^2}{d-1} =$ $-ad$ (d) $\frac{42x^2+23x-10}{14x^2+45x-14} =$ $\frac{6x+5}{2x+7}$

3. Find the domain and the indicated function values for the following functions:

   (a) $f(x) = \frac{x-2}{x-1}$ domain = $\{x \mid x \neq 1\}$ or $(-\infty, 1) \cup (1, \infty)$ $f(1) =$ undefined $f(0) =$ 2

   (b) $h(x) = \frac{(x-3)^2(x+2)}{(x+2)^2(x-3)}$ domain = $\{x \mid x \neq -2, x \neq 3\}$ or $(-\infty, -2) \cup (-2, 3) \cup (3, \infty)$ $f(1) =$ $-\frac{2}{3}$ $f(3) =$ undefined

4. Let $f(x) = x^2 + 1$, compute and simplify $\frac{f(x+h)-f(x)}{h} =$ $2x + h$

Bonus Problem (must complete the rest of the quiz to be eligible):

Long division: $\frac{6a^3-8a+5}{2a-4} =$ $3a^2 + 6a + 8 + \frac{37}{2a-4}$