Math 151 - Quiz 7

April 6, 2016

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (2 points) List all possible rational zeros of $p(x) = 5x^3 + 5x + 8$.

$8: \pm\{1, 2, 4, 8\}$

$5: \pm\{1, 5\}$

POSSIBLE RATIONAL ZEROS ARE

$\pm\left\{1, \frac{1}{5}, 2, \frac{2}{5}, 4, \frac{4}{5}, 8, \frac{8}{5}\right\}$

2. (3 points) Completely factor: $2x^3 - x^2 - x$

$x(2x - x - 1) = x(2x + 1)(x - 1)$

3. (5 points) List all possible rational zeros of $q(x) = 3x^4 + 7x^3 - 13x^2 - 23x - 6$. Then use your graphing calculator to rule out all but four of the possible rational zeros. Finally, choose any one of the remaining four possibilities and use synthetic division to show you have actually found a zero.

$-6: \pm\{1, 2, 3, 6\}$

$3: \pm\{1, 3\}$

POSSIBLE RATIONAL ZEROS ARE

$\pm\left\{1, \frac{1}{3}, 2, \frac{2}{3}, 3, 6\right\}$

BASED ON THE GRAPH, THE ONLY POSSIBLE RAT ZEROS ARE $-3, -1, -\frac{1}{3}, 2$

$$\begin{array}{r|rrrr} 2 & 3 & 7 & -13 & -23 & -6 \\ & & 6 & 26 & 26 & 6 \\ \hline & 3 & 13 & 13 & 3 & 0 \end{array} \Longrightarrow f(2) = 0$$