Quiz10, MAT 1375 Professor Chiu

ID:_____ Name:_____

- This quiz consists of 2 sets of questions for a total of 10 points.
- You have 15 minutes to complete the quiz.
- Scientific calculators are allowed.
- Wishing you success.

True or False questions:

1. F $f(x) = 2x^2 + x^5$ is a polynomial with degree 2.
2. T Odd-degree polynomial functions have graphs with opposite behavior at each end.
3. T Even-degree polynomial functions have graphs with the same behavior at each end.
4. F A root of a polynomial $f(x)$ appears as the y-intercept of the graph of $f(x)$.

leading term x^5; leading coefficient $= 1$; degree $= 5$

x-intercept

Show all your work and justify your answer:

5. Work out the following problems about the polynomial function $f(x) = -3(x-1)^3(2x+4)^2$.

(1.)(2pt) Find the leading term of $f(x)$. Using **the leading coefficient test** to determine the **end behavior** of $f(x)$

$f(x) = -3(x-1)(x-1)(x-1)(2x+4)(2x+4)$

leading term: $(-3)\cdot x\cdot x\cdot x\cdot 2x\cdot 2x = -12x^5$

leading coefficient: $-12 \Rightarrow -12$ is negative

degree: $5 \Rightarrow 5$ is an odd number

End behavior: $(\uparrow, \searrow)$

$x \to -\infty, f \to \infty$

$x \to \infty, f \to -\infty$

(2.)(2pt) Find the **zeros** of $f(x)$ and their **multiplicities**.

zeros of $f(x) \Rightarrow x$ makes $f(x) = 0 \Rightarrow f(x) = -3(x-1)^3(2x+4)^2 = 0$

zero: $x = 1$ $((x-1)=0 \Rightarrow x=1)$, $x = -2$ $(2x+4=0 \Rightarrow x=-2)$

multiplicity (How many times the zero repeat): 3 (times), 2 (times)

(3.)(2pt) Find the y-intercept of $f(x)$.

y-intercept of $f(x) \Rightarrow$ the value of $f(x)$ when $x=0$

$f(0) = -3(0-1)^3(2\cdot 0+4)^2 = -3\cdot(-1)^3\cdot(4)^2 = 48$