

## Quiz #6

Name: \_\_\_\_\_

READ AND FOLLOW ALL DIRECTIONS. CIRCLE YOUR FINAL ANSWERS.  
SHOW ALL WORK TO RECEIVE FULL CREDIT. NO CALCULATORS.

1. (4 points) Identify whether or not each of the following functions is a polynomial. If the function is a polynomial, give its degree; if not, state your reason.

(a)  $f(x) = 54$

(b)  $g(x) = (x^2 + 5)(x^3 + 6x + 2)$

(c)  $s(x) = x^{\frac{7}{2}} + x^3 + x$

(d)  $R(x) = \frac{1}{x^2+2x+3}$

2. (2 points) Circle the correct option:

The graph of  $f(x) = x^n$ , for  $n$  even, is symmetric about the (origin/y-axis/neither).

The graph of  $f(x) = x^n$ , for  $n$  odd, is symmetric about the (origin/y-axis/neither).

3. (2 points each) Identify the domain of each of the following functions:

(a)  $f(x) = x(x + 2)(x + 3)$

(b)  $R(x) = \frac{x^2+4x+3}{x^2-1}$

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4. (10 points) Let  $f(x) = x(x^2 + 2x + 1)$

(a) Identify the x-intercepts of the graph of  $f$ .

(b) Identify the y-intercepts of the graph of  $f$ .

(c) Determine whether the graph crosses or touches the x-axis at each x-intercept. (e.g. "The graph of (crosses/touches) the x-axis at  $x=c$ .")

(d) Identify the power function that the graph of  $f$  resembles for large values of  $|x|$ .

5. (2 points) EXTRA CREDIT. What is the minimum degree of a polynomial whose graph has 4 turning points?