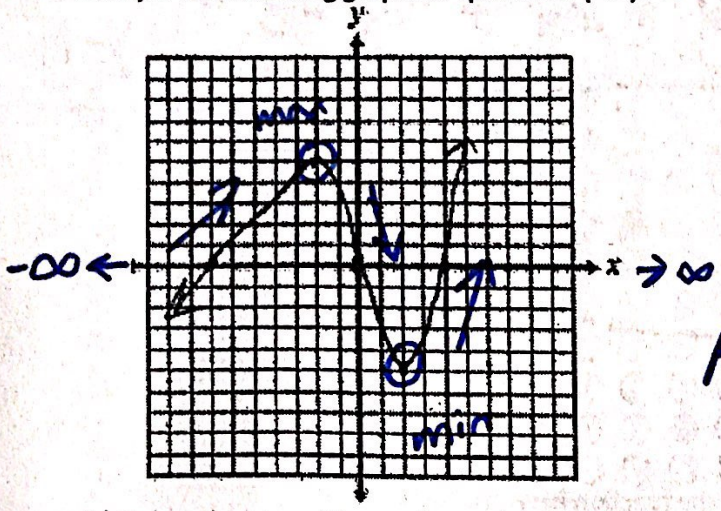
Name: Key Date:

Polynomial Functions Test Review

Analyze the following graph for questions (1-3):



1.) What is the end behavior of this function?

As $x \to \infty, f(x) \to$ ∞

As $x \to -\infty, f(x) \to$ -∞

2.) What are the relative maximum and relative minimum?

A

a) Max: $(-2,5)$ Min: $(2,-5)$
b) Max: $(2,-5)$ Min: $(-2,5)$
c) Max: $(-2,\infty)$ Min: $(2,-\infty)$
d) Max: $(2,-\infty)$ Min: $(-2,\infty)$

3.) Select the correct increasing and decreasing intervals from the following options (Not all intervals should be used).

a) $(-\infty,5)$ b) $(-2,2)$ c) $(0,2)$ d) $(2,\infty)$ e) $(-\infty,-2)$ f) $(5,-5)$

Increasing interval(s): E, D Decreasing Interval(s): B

Solve the following equations:

4.) $(x-1)(3x+1)(x-7)=0$

$x-1=0 \quad 3x+1=0 \quad x-7=0$

$x=1 \quad x=\frac{-1}{3} \quad x=7$

$x=\{-\frac{1}{3}, 1, 7\}$

4._____

5.) $9x^4-36=0$

$(3x^2)^2-(6)^2=0$

$(3x^2+6)(3x^2-6)=0$

$3x^2+6=0$
$3x^2=-6$
$\sqrt{x^2}=\sqrt{-2}$
$x=\pm i\sqrt{2}$

$3x^2-6=0$
$\sqrt{x^2}=\sqrt{2}$
$x=\pm\sqrt{2}$

$x=\{\pm\sqrt{2}, \pm i\sqrt{2}\}$

5._____

Perform the indicated operation:

6.) $(2y^4 + 2y^2 - 7y + 5) \div (y - 1)$ → $k = 1$

$$\begin{array}{c|ccccc} 1 & 2 & 0 & 2 & -7 & 5 \\ & \downarrow & 2 & 2 & 4 & -3 \\ \hline & 2 & 2 & 4 & -3 & 2 \end{array}$$

$2y^3 + 2y^2 + 4y - 3 + \frac{2}{y-1}$

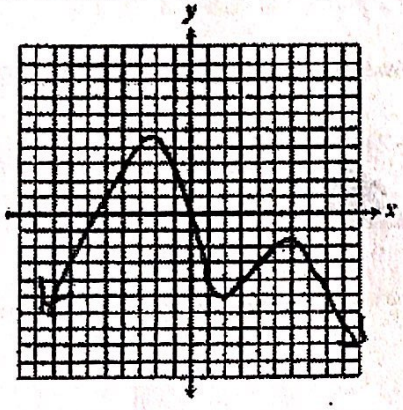
6. _____

7.) $(2x^3 - 2x^2 + x - 3) - (5x^3 + 2x^2 - 7)$

$-3x^3 - 4x^2 + x + 4$

7. _____

Analyze the following graph for questions 8-9:



8.) State whether the function is even or odd.

even

9.) State whether the function has a positive or negative leading coefficient.

negative

Factor the following polynomials:

10.) $8x^3 - 1$ diff of cubes!

$(2x)^3 - (1)^3$

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

10. $(2x-1)(2x^2+2x+1)$

11.) $4x^5 - 18x^3 + 20x$

GCF → $x(4x^4 - 18x^2 + 20)$

80, -10, -8, -18

$4x^4 - 10x^2 - 8x^2 + 20$

$2x^2(2x^2-5) - 4(2x^2-5)$

$x(2x^2-5)(2x^2-4)$

$x(2x^2-5)(2x^2-4)$

11. _____

12.) $b^3 + 2b^2 - 36b - 72$

$b^2(b+2) - 36(b+2)$

$(b+2)(b^2-36)$ diff of squares

$(b+2)(b+6)(b-6)$

12. $(b+2)(b+6)(b-6)$