

Exam VI Review II - 6.4-6.7

Key

Algebra 2

Period _____

1. Graph $f(x) = 2x^3 + 6x^2 + 2x - 6$, then estimate the local maximum, minimum, and zero.

Handwritten scribble

A) max = -4.17, min = -2, zero = 3.

B) max = .18, min = -4.09, zero = 2.89

C) max = -1.82, min = -6.17, zero = .77

D) max = -1.91, min = 1.82, zero = -2

2. Use the Rational Root Theorem to list all the possible rational roots of $x^3 + 4x^2 - 6x - 9 = 0$.

A) $\pm 1, \pm 3, \pm 9$

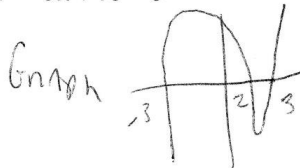
B) $\pm 1, \pm 2, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{1}{9}, \pm \frac{2}{9}$

C) $\pm 1, \pm 3, \pm 9, \pm \frac{1}{3}, \pm \frac{2}{3}, \pm \frac{1}{9}, \pm \frac{2}{9}$

D) $\pm 1, \pm 3, \pm 9, \pm \frac{1}{2}, \pm \frac{3}{2}, \pm \frac{9}{2}$

3. Solve by finding all roots.

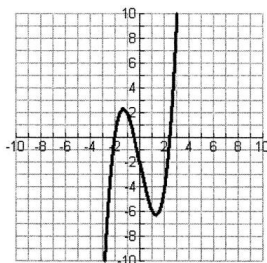
$x^3 - 2x^2 - 9x + 18 = 0$



Handwritten notes: $x = -3$, $x = 2$, $x = 3$

4. Identify whether the function graphed has an even or odd degree and a positive or negative leading coefficient. Circle the correct answer. Then determine the end behavior.

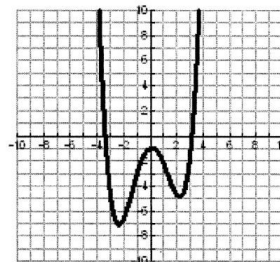
a.



Degree: Even/Odd
 Leading Coefficient: Positive/Negative
 End Behavior:

$x \rightarrow -\infty, f(x) \rightarrow -\infty$
 $x \rightarrow +\infty, f(x) \rightarrow +\infty$

b.



Degree: Even/Odd
 Leading Coefficient: Positive/Negative
 End Behavior:

$x \rightarrow -\infty, f(x) \rightarrow +\infty$
 $x \rightarrow +\infty, f(x) \rightarrow +\infty$

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$x=2 \quad x=-2 \quad x=-3 \Rightarrow (x-2)(x+2)(x+3)$

5. Write the simplest polynomial function with zeros of 2, -2, and -3

A) $f(x) = x^3 + 3x^2 - 4x - 12$

B) $f(x) = x^3 - 9x^2 + 6x - 14$

C) $f(x) = x^3 - 3x^2 - 2x + 24$

D) $f(x) = -x^3 + 3x^2 + 2x - 24$

6. Determine the end behavior of the following functions.

a. $f(x) = -x^3 + 5x^2 - 6x + 6$

b. $f(x) = -3x^4 - 5x^3 - x^2 + 2x - 5$

$x \rightarrow -\infty, f(x) \rightarrow +\infty$

$x \rightarrow -\infty, f(x) \rightarrow -\infty$

$x \rightarrow +\infty, f(x) \rightarrow -\infty$

$x \rightarrow +\infty, f(x) \rightarrow -\infty$

7. Solve each polynomial equation by factoring.

a. $x^3 - x^2 - 9x + 9 = 0$

b. $x^4 - 6x^2 + 8 = 0$

$x^2(x-1) - 9(x-1) = 0$

$(x^2-2)(x^2-4) = 0$

$(x^2-9)(x-1)$
 $(x+3)(x-3)(x-1)$

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

$x=3$
 $x=3$
 $x=-1$

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

Factor the following binomials

8. $4x^2 - 36y^2$

9. $y^3 + 8$

$4(x^2 - 9y^2)$

$4(x-3y)(x+3y)$

$(y+2)(y-2y+4)$