Algebra 2 3Tri
6.1 – 6.3 & Graphing Review

Name: Key

Period: _____ Date: _____

You should complete this review **without** the use of a calculator.

1. Factor completely and find all of the zeros of each polynomial.

a. $y = x^4 - 64x^2$

$x^2(x^2-64)$

$x^2(x+8)(x-8)$

$x = 0, -8, 8$

b. $y = 2x^5 - 12x^4 + 18x^3$

$2x^3(x^2-6x+9)$

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

$x=0 \quad x=3$

c. Classify each polynomial above by degree and number of terms.

quartic binomial

quintic trinomial

2. Find key features to graph each polynomial equation. (Include x-intercepts, y-intercept, end behavior, and cross/bounce)

a. $f(x) = x^3(x+2)(x-1)(x+5)$

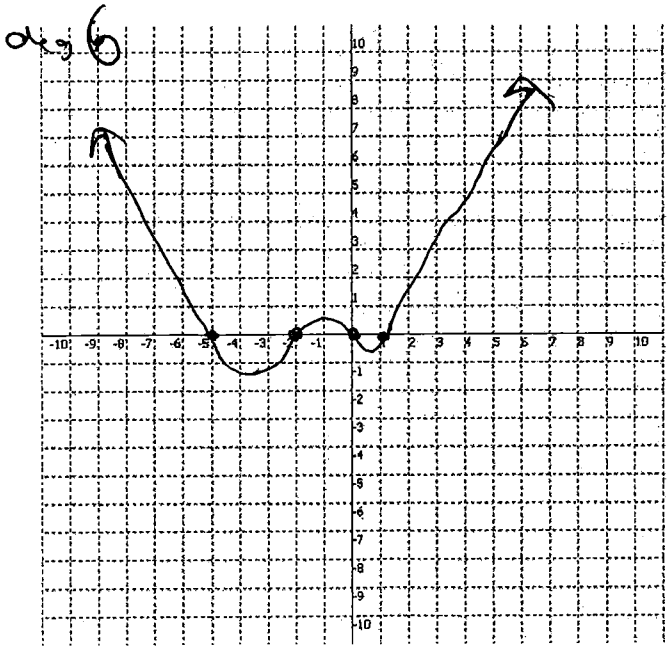
$x=0$ m3 c

$x=-2$ m1 c

$x=1$ m1 c

$x=-5$ m1 c

deg 6

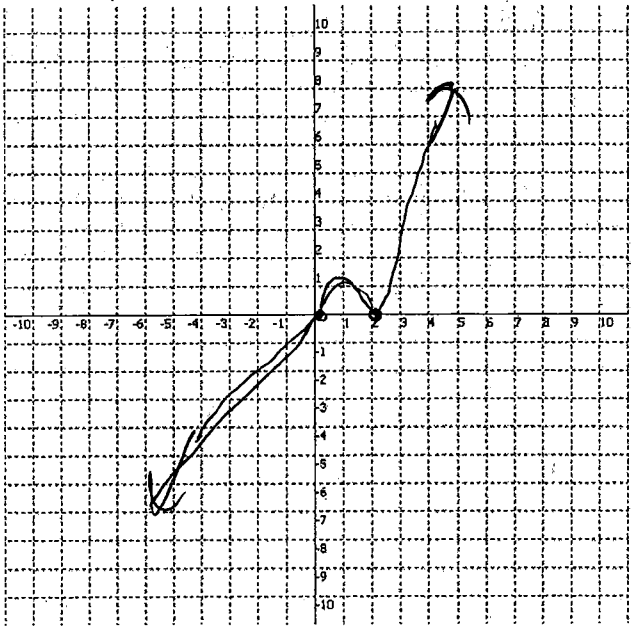


b. $f(x) = x^3 - 4x^2 + 4x$

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

$x(x-2)(x-2)$

$x=0$ m1 $\quad x=2$ m2



3. Is $x-1$ a factor of each polynomial? Use synthetic division to assist. Justify your response.

a. $x^3 + 5x^2 + 10x + 2$

1 | 1 5 10 2
1 6 16
1 6 16 18

No, has remainder

b. $x^3 - 1$

1 | 1 0 0 -1
1 1 1
1 1 1 0

Yes, remainder = 0

4. Divide with synthetic division and then factor the polynomial completely.

a. $x^3 - 2x^2 - 9x + 18 \div (x-2)$

2 | 1 -2 -9 18
2 0 -18
1 0 -9 0

$x^2 - 9$

$(x-2)(x+3)(x-3)$

b. $5x^3 - x^2 - 80x + 16 \div (5x-1)$

1/5 | 5 -1 -80 16
1 0 -16
5 0 -80 0

$5x^2 - 80$

$5(x^2 - 16)$

$5(x+4)(x-4)(5x-1)$

5. Use the remainder theorem to evaluate P(-2) for each polynomial equation.

a. $P(x) = 4x^3 + 3x^2 - 8x + 10$

-2 | 4 3 -8 10
-8 10 -4
4 -5 2 6

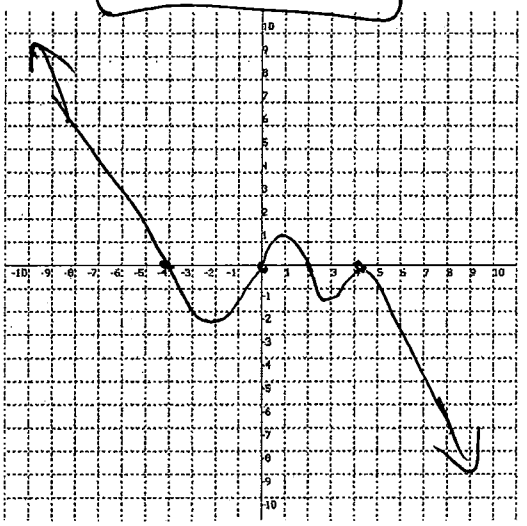
$P(-2) = 6$

b. $P(x) = x^6 + 3x^3 - 12$

-2 | 1 0 0 3 0 0 -12
-2 4 -8 16 -20 40
1 -2 4 -5 10 -20 28

$P(-2) = 28$

6. Sketch the graph of an 7th degree polynomial with a negative leading coefficient with zeros of multiplicity one at ~~–4 and 0~~, a zero of multiplicity three at 2, and a zero of multiplicity two at 4.



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

Write an equation for the above info in factored form.

7. If (2x+1) is a factor of some polynomial, what does that tell us about the graph?

tells us that $-1/2$ is an x-int.