Secondary Math III
HW 8-3 Graphing Polynomials from Standard Form

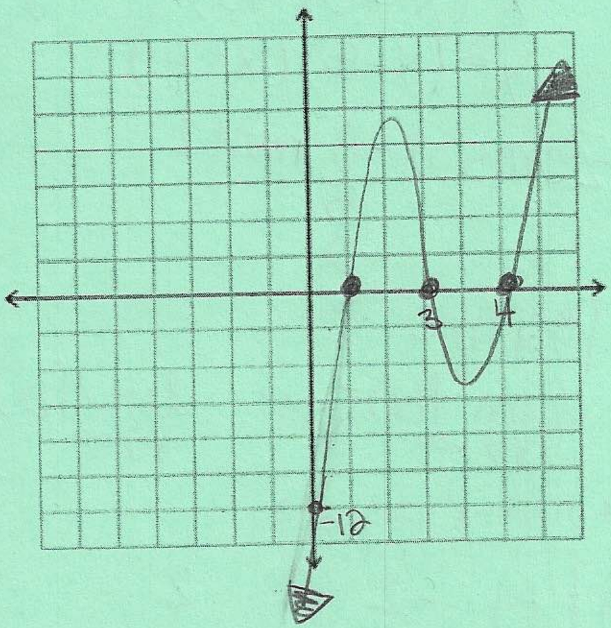
Name: Answer Key
Period:________

Given one zero, find the zeros of the polynomials, graph by hand, state the degree, whether it is positive or negative, and end behavior.

1. Given 1 is a zero, $f(x) = x^3 - 8x^2 + 19x - 12$

$$\begin{array}{r|rrrr} 1 & 1 & -8 & 19 & -12 \\ & \downarrow & 1 & -7 & 12 \\ \hline & 1 & -7 & 12 & 0 \end{array}$$

y-intercept -12



$x^2 - 7x + 12$

$(x-3)(x-4)$

Zeros: 1, 3, 4

Degree: 3

Positive

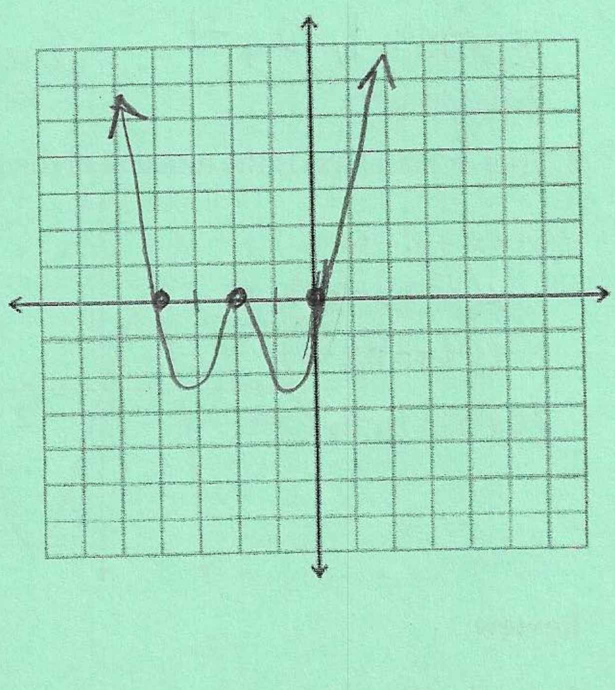
$\lim_{x \to -\infty} f(x) = -\infty$

$\lim_{x \to \infty} f(x) = \infty$

2. Given -4 is a zero, $f(x) = x^4 + 8x^3 + 20x^2 + 16x$

$$\begin{array}{r|rrrr} -4 & 1 & 8 & 20 & 16 \\ & \downarrow & -4 & -16 & -16 \\ \hline & 1 & 4 & 4 & 0 \end{array}$$

y-int. 0



$x^2 + 4x + 4 \quad (x+2)(x+2)$

Zeros: 0, -4, -2 mult. 2

Degree: 4

Positive

$\lim_{x \to -\infty} f(x) = \infty \quad \lim_{x \to \infty} f(x) = \infty$

Using factoring, find the zeros of the polynomials, graph by hand, state the degree, whether it is positive or negative, and end behavior.

3. $f(x) = x^4 - 3x^3 - 10x^2$

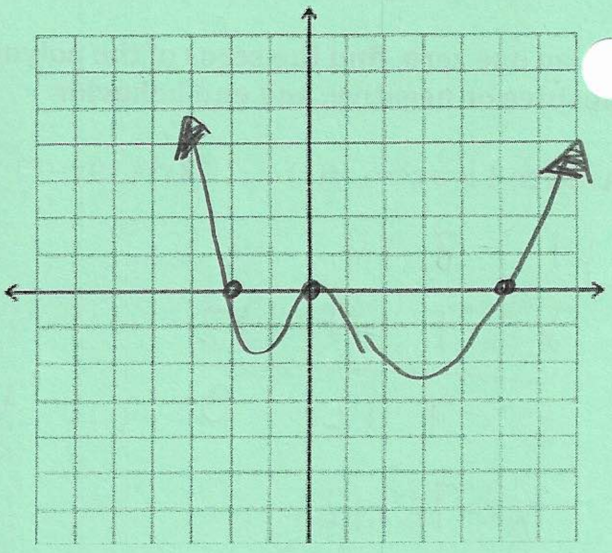
$x^2(x^2 - 3x - 10)$ Degree 4

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

Zeros $x = 0$, mult 2
5
-2

Positive

$\lim_{x \to -\infty} f(x) = \infty$ $\lim_{x \to \infty} f(x) = \infty$



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

$$\begin{array}{r|rrrr} 1 & -1 & -2 & 1 & 2 \\ & \downarrow & -1 & -3 & -2 \\ \hline & -1 & -3 & -2 & 0 \end{array}$$

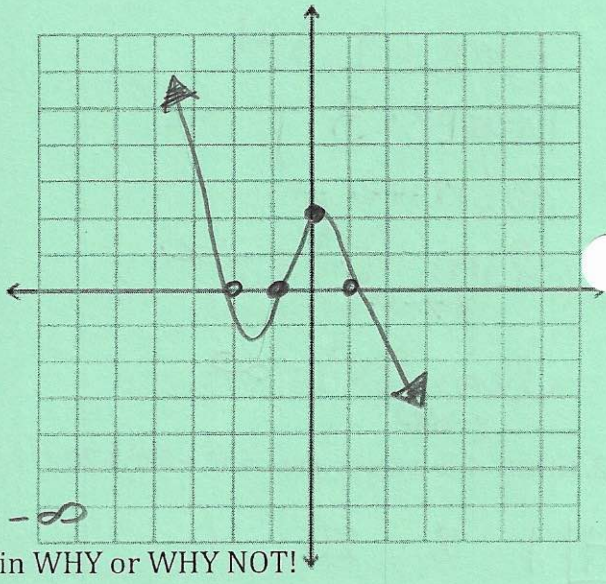
$-x^2 - 3x - 2$

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

Zeros: $1, -2, -1$ $\lim_{x \to -\infty} f(x) = \infty$

Negative

$\lim_{x \to \infty} f(x) = -\infty$



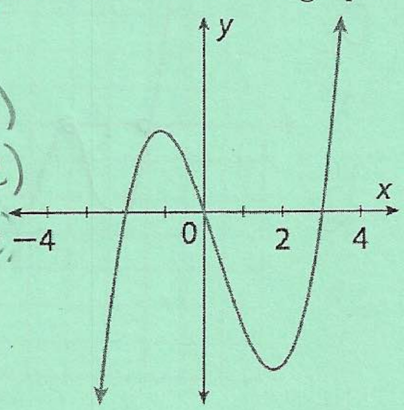
5. True or False: f(x) is the function of the graph below. Explain WHY or WHY NOT!

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

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

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

Zeros: $0, -3, 2$



No. The zeros are not correct.

Review

Factor the following

1. $27y^3 - 8$

$(3y-2)(9y^2 + 6y + 4)$

2. $4z^2 - 4z + 1$

$(2z-1)(2z-1)$

$(2z-1)^2$

3. $2x^3 - 3x^2 + 2x - 3$

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

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