

Name: Key Hour: _____ Date: _____

Graphing (Factored) Polynomials Notes

Definition:

Zeros: x-ints, solutions, roots

↳ where a graph crosses, or touches, the x-axis

Find the zeros of the following factored polynomials.

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

$$\begin{array}{r} x - 2 = 0 \\ +2 \quad +2 \\ \hline x = 2 \end{array}$$

$$\begin{array}{r} x + 1 = 0 \\ -1 \quad -1 \\ \hline x = -1 \end{array}$$

$$\begin{array}{r} x + 3 = 0 \\ -3 \quad -3 \\ \hline x = -3 \end{array}$$

2) $y = 2x(x - 7)(x + 5)(x + 1)$

$$\begin{array}{r} 2x = 0 \\ 2 \\ \hline x = 0 \end{array}$$

$$\begin{array}{r} x - 7 = 0 \\ +7 \quad +7 \\ \hline x = 7 \end{array}$$

$$\begin{array}{r} x + 5 = 0 \\ -5 \quad -5 \\ \hline x = -5 \end{array}$$

$$\begin{array}{r} x + 1 = 0 \\ -1 \quad -1 \\ \hline x = -1 \end{array}$$

Steps for Sketching the Graph of a (Factored) Polynomial:

1) Find the zeros.

2) Determine end-behavior. All we really need to know is the direction of the arrows.

- The number of zeros will help you to determine if the polynomial is even or odd.
- Assume that the polynomial is positive unless there is a negative sign attached to an x.

3) Plot the zeros on the x-axis and connect them accordingly.

- HINT:** Start with the end behavior.

*** At this point in time we will not be concerned with the y-values of the polynomial ***

For each of the following (factored) polynomials:

a) Find the zeros

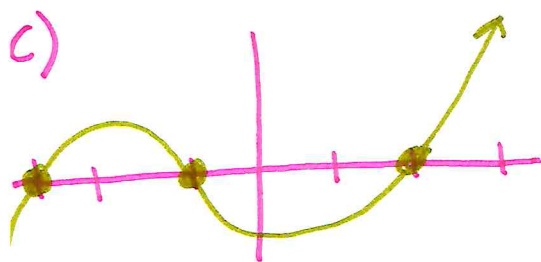
b) Determine if the polynomial is positive/negative and even/odd and use arrows to describe the end behavior.

c) Graph the polynomial

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

a) $x = 2$ $x = -1$ $x = -3$

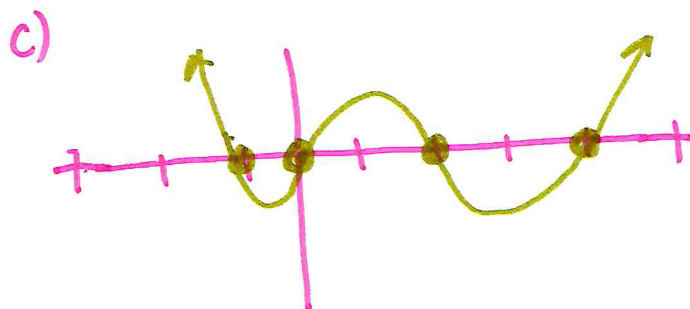
b) positive odd $\downarrow \uparrow$



2) $y = x(x - 2)(x + 1)(x - 4)$

a) $x = 0$ $x = 2$ $x = -1$ $x = 4$

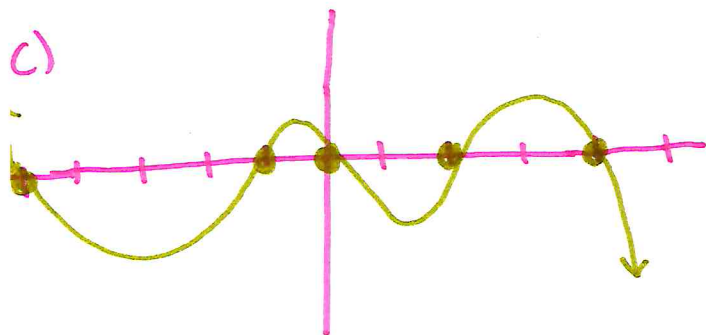
b) positive even $\uparrow \uparrow$



3) $y = -x(x - 2)(x + 1)(x + 5)(x - 4)$

a) $x = 0$ $x = 2$ $x = -1$ $x = -5$ $x = 4$

b) negative odd $\uparrow \downarrow$



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

a) $x = 0$ $x = -4$

b) negative even $\downarrow \downarrow$

