Today's Plan:

Learning Target (standard): I will graph polynomial functions using the 5-step process.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

For each polynomial, tell the degree, the MTP, the zeros and their multiplicity and whether the graph will cross or touch the x-axis at the zero, and the EB function with the behavior.

$f(x) = -3(2x+1)^3(2x-7)^3(x-3)^2$ $-3 \cdot 8x^3 \cdot 8x^3 \cdot x^2$

$= -192x^8$

degree: 8

MTP: 7

Zeros: $x = -\frac{1}{2}$ mult. 3 → crosses x-axis

$x = \frac{7}{2}$ mult. 3 → crosses x-axis

$x = 3$ mult. 2 → touches x-axis

EB: $f(x) = -192x^8$ down on left

down or right

For each polynomial, tell the degree, the MTP, the zeros and their multiplicity and whether the graph will cross or touch the x-axis at the zero, and the EB function with the behavior.

$f(x)=4(x-3)^2(2x+5)^3(4x-3)^2$ $4\cdot x^2\cdot 8x^3\cdot 16x^2$ $512x^7$

degree: 7

MTP: 12

Zeros: $x=3$ mult. 2 → touches x-axis

$x=-\frac{5}{2}$ mult. 3 → crosses x-axis

$x=\frac{3}{4}$ mult. 2 → touches x-axis

EB:

$f(x)=512x^7$ down on left

up on right

For each polynomial, tell the degree, the MTP, the zeros and their multiplicity and whether the graph will cross or touch the x-axis at the zero, and the EB function with the behavior.

$f(x)=-4(x-1)^4(2x+7)^3$ $-4\cdot x^4\cdot 8x^3=-32x^7$

degree: 7

MTP: 12

Zeros: $x=1$ mult. 4 → touches x-axis

$x=-\frac{7}{2}$ mult. 3 → crosses x-axis

EB:

$f(x)=-32x^7$ up on left

down on right

For each polynomial, tell the degree, the MTP, the zeros and their multiplicity and whether the graph will cross or touch the x-axis at the zero, and the EB function with the behavior.

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

$-3 \cdot 9x^2 \cdot x^6 = -27x^8$

$(x+\sqrt{5})^3(x-\sqrt{5})^3$

degree: 8

MTP: 7

Zeros: $x = -\frac{2}{3}$ mult. 2 → touches x-axis

$x = -\sqrt{5}$ mult. 3 → crosses x-axis

EB: $x = \sqrt{5}$ mult. 3 → crosses x-axis

$f(x) = -27x^8$ down on left

down on right

Graphing a Polynomial Function: "5-Step Process"

1) State the degree and the MTP. Factor the function, if necessary, and then:

   a) Find the *x*-intercepts, if any, by solving the equation f(x) = 0

   b) Find the *y*-intercept by letting *x* = 0 and finding the value of f(0)

$$f(x) = x^2(x-2)$$

$x^2 \cdot x = x^3$

① degree: 3

MTP: 2

I_x: (0,0), (2,0)

I_y: (0, 0)

$f(0) = 0^2(0-2)$

$= 0(-2)$

$f(0) = 0$

Graphing a Polynomial Function:

2) Determine whether the graph of f(x) crosses or touches the x-axis at each zero of the function

3) Find the power function that the graph of f(x) resembles for large values of *x*

end behavior

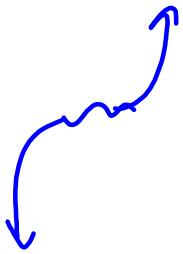
$$f(x) = x^2(x-2)$$

2) zeros:

x=0 mult. 2 → touches x-axis

x=2 mult. 1 → crosses x-axis

3) EB: $f(x) = x^3$ down on left, up on right

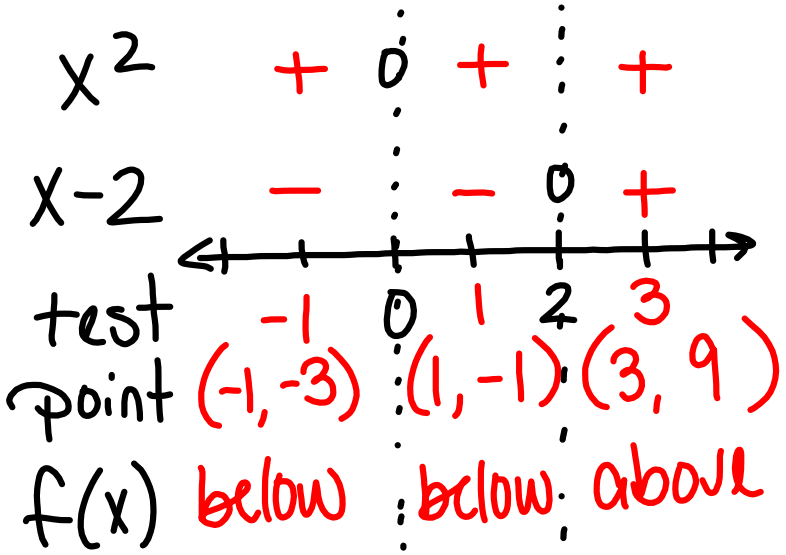


Graphing a Polynomial Function:

4) Use the factors(s) and test numbers to find intervals on which the graph of f(x) is above the *x*-axis and intervals on which the graph is below the *x*-axis.

- this will be a form of a +/- chart

$$f(x) = x^2(x-2)$$



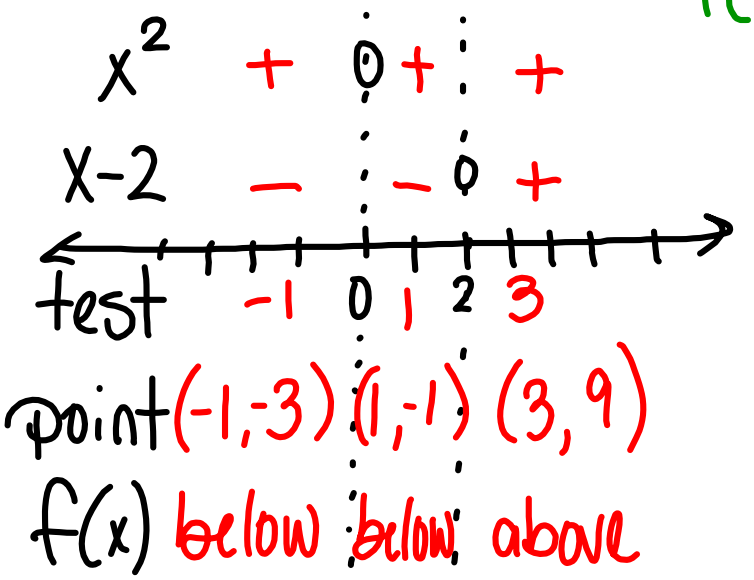
Graphing a Polynomial Function:

4) Use the factors(s) and test numbers to find intervals on which the graph of f(x) is above the *x*-axis and intervals on which the graph is below the *x*-axis.

- this will be a form of a +/- chart

$f(x) = x^2(x-2)$

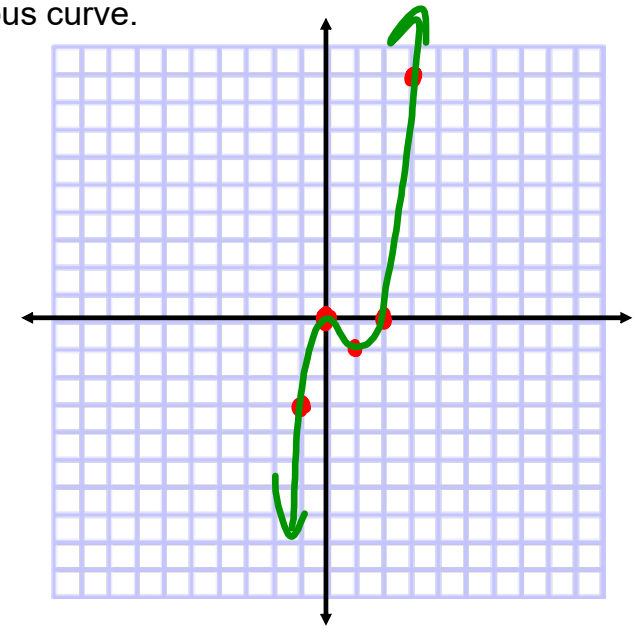
$f(-1)=(-1)^2(-1-2)$



Graphing a Polynomial Function:

5) Plot points obtained in Steps 1 and 4, and use the remaining information to connect them with a smooth, continuous curve.

$f(x) = x^2(x-2)$



Assignment:

p.213 #33, 41, 43