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.

Go over your 5-step process with someone around you!

* QUIZ Tomorrow on graphing using transformations and the 5-Step Process! *

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.

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

$-2 \cdot 64x^3 \cdot -x^5$

$128x^8$

degree: 8

MTP: 7

Zeros: $x = \frac{1}{4}$ mult. 3 → crosses x-axis

$x = 2$ mult. 5 → crosses x-axis

EB: $f(x) = 128x^8$

up on left
up on right

Graph using transformations:

$$f(x) = -\frac{1}{2}\left(\frac{1}{2}x+2\right)^4 - 3$$
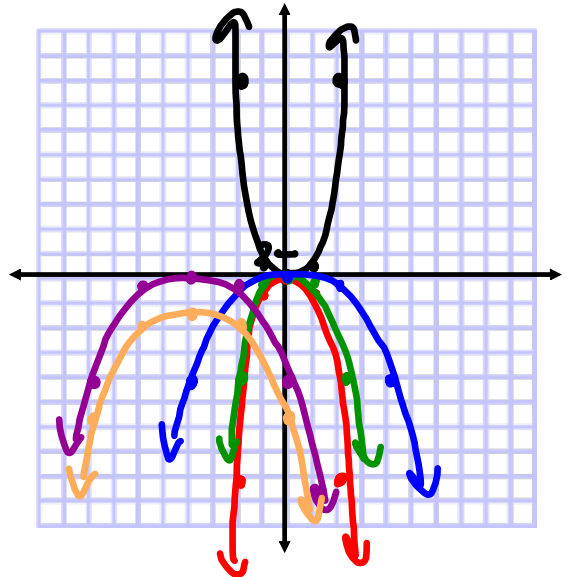
parent: $f(x) = x^4$

1) $f(x) = -x^4$ r_x

2) $f(x) = -\frac{1}{2}x^4$ v.c. by $\frac{1}{2}$

3) $f(x) = -\frac{1}{2}\left(\frac{1}{2}x\right)^4$ h.s. by 2

4) $f(x) = -\frac{1}{2}\left(\frac{1}{2}(x+4)\right)^4$ shift left 4

5) $f(x) = -\frac{1}{2}\left(\frac{1}{2}x+2\right)^4 - 3$ shift down 3

x	y
-2	16
-1	1
0	0
1	1
2	16

Graph using the 5-step process:

$$f(x) = x^2(x-4)(x+1) \quad x^2 \cdot x \cdot x = x^4$$

1) degree: 4
   MTP: 3
   I_x: $(0,0), (4,0), (-1,0)$
   I_y: $(0,0)$

2) zeros:
   x=0 mult 2 →touches x-axis
   x=4 mult 1→ crosses x-axis
   x=-1 mult. 1→ crosses x-axis

3) EB: $f(x) = x^4$
   up on left
   up on right

4)

x^2	+	+ 0 +	+	
x-4	−	− −	0 +	
x+1	−	0 + +	+	
test	-2	-1.$\frac{1}{2}$ 0 1	4 5	
point	(-2,24)	($-\frac{1}{2}, -\frac{9}{16}$) (1,-6)	(5,150)	
f(x)	above	below below	above	

Consult the illustration. Which of the following polyn[...]
answer may be possible.)

a) $y = -4x(x-1)(x-2)$ $-4x^3$
b) $y = x^2(x-1)^2(x-2)$ x^5
c) $y = 3x(x-1)(x-2)$ $3x^3$
d) $y = x(x-1)^2(x-2)^2$ x^5
e) $y = x^3(x-1)(x-2)$ x^5
f) $y = -x(1-x)(x-2)$ x^3

C, e, f

1) degree: @ least 3 and odd
   MTP: @ least 2 and even
   I_x: $(0,0), (1,0), (2,0)$
   I_y: $(0,0)$

2) zeros:
   x=0 mult. odd →crosses x-axis
   x=1 mult. odd →crosses x-axis
   x=2 mult. odd →crosses x-axis

3) EB: $f(x) = ax^n$
   n=odd
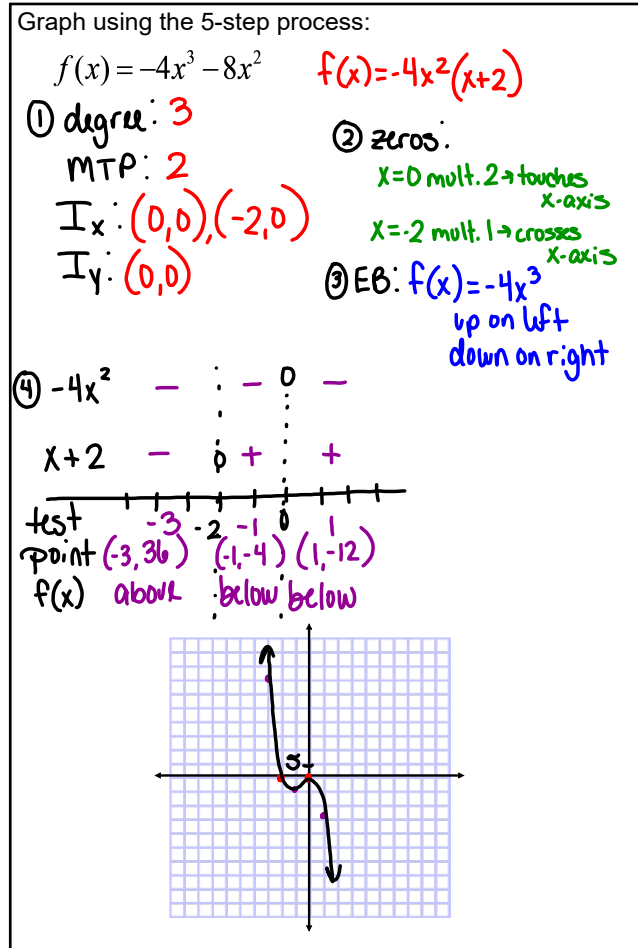   a (+) down on left
   up on right

4) +/- factor chart

x	−	0 +	+	+
x-1	−	−	0 +	+
x-2	−	−	−	0 +
test	-1	0 $\frac{1}{2}$	$\frac{3}{2}$ 2	3
point				
f(x)	below	above	below	above

* check test points on graph in remaining equations
   to see if the above/below characteristics fit *

Graph using the 5-step process:

$$f(x) = -4x^3 - 8x^2 \qquad f(x) = -4x^2(x+2)$$

① degree: 3

MTP: 2

I_x: $(0,0), (-2,0)$

I_y: $(0,0)$

② zeros:

X = 0 mult. 2 → touches x-axis

X = -2 mult. 1 → crosses x-axis

③ EB: $f(x) = -4x^3$

up on left

down on right

④ $-4x^2$ — : — 0 —

X + 2   —   0 + :   +

test point   (-3, 36)   (-1, -4)   (1, -12)

-3 -2 -1 0 1

f(x)   above   below   below

Assignment:

p.213 #47, 48, 53 - use the 5-step process

p.213 #56 & 58 - use the example analysis

* draw the graph for these & write the problem

* Quiz on graphing polynomials tomorrow *