Graph all three of these in a Standard Window:

$Y_1 = 4x - 2$

$Y_2 = 0.25x^3 + x + 1$

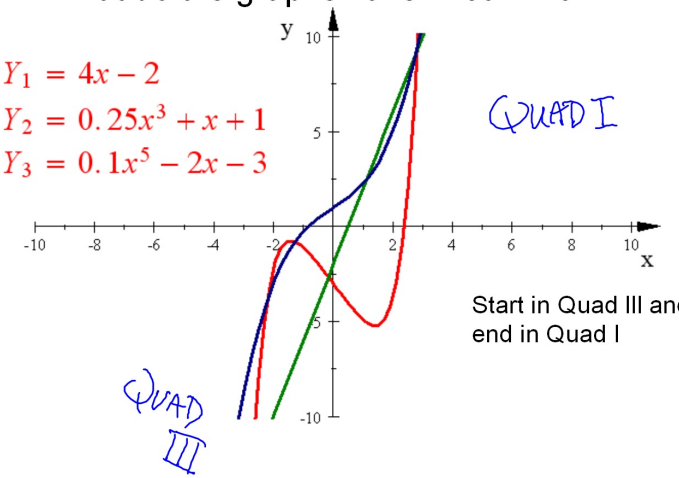
$Y_3 = 0.1x^5 - 2x - 3$

What do the graphs have in common?

$Y_1 = 4x - 2$

$Y_2 = 0.25x^3 + x + 1$

$Y_3 = 0.1x^5 - 2x - 3$



Start in Quad III and end in Quad I

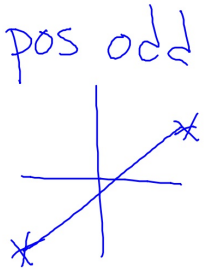
What do the equations have in common?

$Y_1 = 4x - 2$

$Y_2 = 0.25x^3 + x + 1$

$Y_3 = 0.1x^5 - 2x - 3$

All are positive odd functions

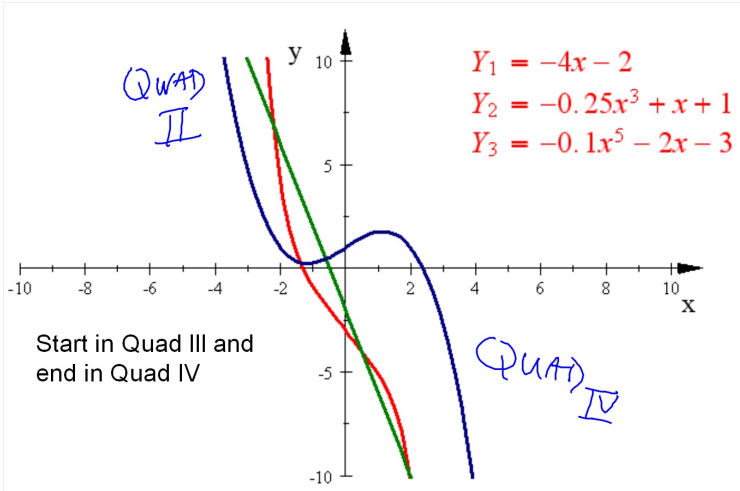


$Y_1 = -4x - 2$

$Y_2 = -0.25x^3 + x + 1$

$Y_3 = -0.1x^5 - 2x - 3$

What would happen if they all had a negative leading coefficient?



Odd Functions: Largest exponent is ODD
This is called the degree of the function.

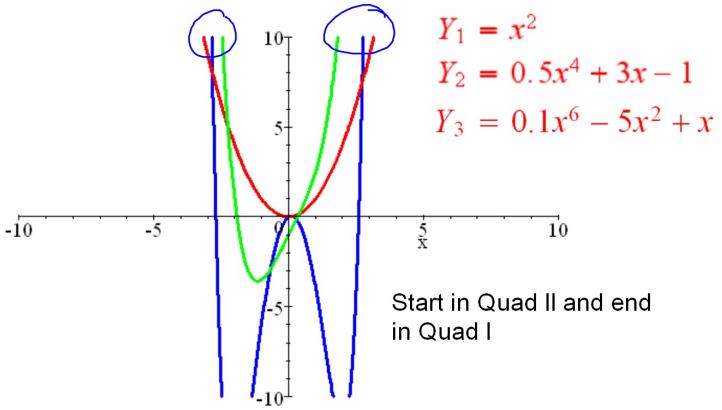
Positive Leading Coefficient:
Moves from the third quadrant to the first quadrant.
Like a line with a Positive slope

Negative Leading Coefficient:
Moves from the second quadrant to the fourth quadrant.
Like a line with a Negative slope

Graph all three of these in a Standard Window:

$$Y_1 = x^2$$
$$Y_2 = 0.5x^4 + 3x - 1$$
$$Y_3 = 0.1x^6 - 5x^2 + x$$

What do the graphs have in common?



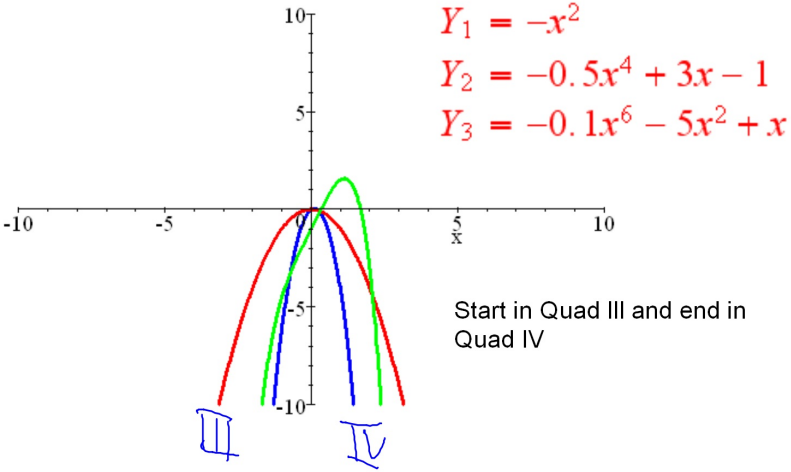
What do the equations have in common?

$$Y_1 = x^2$$
$$Y_2 = 0.5x^4 + 3x - 1$$
$$Y_3 = 0.1x^6 - 5x^2 + x$$

All are positive even functions

$$Y_1 = x^2$$
$$Y_2 = 0.5x^4 + 3x - 1$$
$$Y_3 = 0.1x^6 - 5x^2 + x$$

What would happen if they all had a negative leading coefficient?



$$Y_1 = -x^2$$
$$Y_2 = -0.5x^4 + 3x - 1$$
$$Y_3 = -0.1x^6 - 5x^2 + x$$

Start in Quad III and end in Quad IV

Even Functions: Largest exponent is EVEN

This is called the degree of the function.

Positive Leading Coefficient:

Moves from the second quadrant to the first quadrant.

Like a parabola with a>0

Negative Leading Coefficient:

Moves from the third quadrant to the fourth quadrant.

Like a parabola with a<0