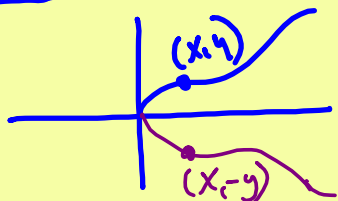
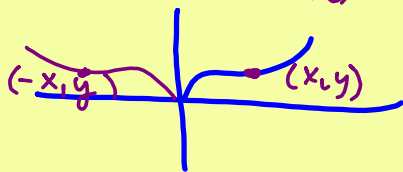


SYMMETRY

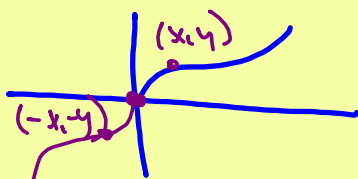
x-axis
Sub in $-y$



y-axis
Sub in $-x$



origin
Sub in
 $-x + -y$



$$y = 2x^2 + 1$$

x-axis $-y = 2x^2 + 1$ No

y-axis $y = 2(-x)^2 + 1$ yes
 $y = 2x^2 + 1$

origin $-y = 2(-x)^2 + 1$
 $-y = 2x^2 + 1$ No

Must get
original eq.
back

$$4xy + 2x^2 = 7$$

x-axis $4x(-y) + 2x^2 = 7$ No
 $-4xy + 2x^2 = 7$

y-axis $4(-x)y + 2(-x)^2 = 7$ No
 $-4xy + 2x^2 = 7$

origin $4(-x)(-y) + 2(-x)^2 = 7$ yes
 $4xy + 2x^2 = 7$

EVEN/ODD FUNCTIONS

Y-axis
Symm.

EVEN

$$f(-x) = f(x)$$

Origin
Symm.

ODD

$$f(-x) = -f(x)$$

$$f(x) = \frac{4x}{3x^2 - 5}$$

$$f(-x) = \frac{4(-x)}{3(-x)^2 - 5} = \frac{-4x}{3x^2 - 5}$$

Odd

$$= -\frac{4x}{3x^2 - 5}$$

$$\frac{-1}{2} \quad \frac{1}{-2} \quad -\frac{1}{2}$$

$$f(x) = 3x^6 - 2x^2 + 4$$

$$f(-x) = 3(-x)^6 - 2(-x)^2 + 4$$

$$= 3x^6 - 2x^2 + 4$$

Even

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

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

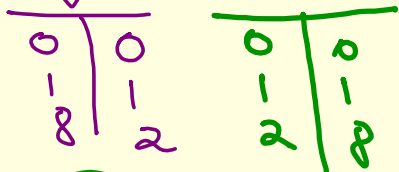
$$= -x^3 + x + 1$$

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

Neither

$$f(x) = \begin{cases} -3|x+5|+2 & x < -2 \\ \sqrt[3]{x+1} + 1 & -2 \leq x \leq 7 \\ (x-8)^3 + 1 & x > 7 \end{cases}$$

\swarrow slope
 \uparrow right up



$$y = 2x + 3 \quad x < -2$$

