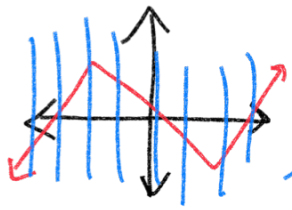
MTH-PC College Algebra Session 17 11/7

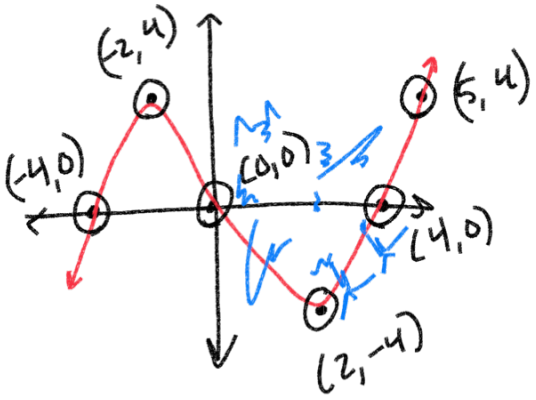
1.) $\{(0,1), (1,0), (2,1), (-2,1), (5,4), (-3,4)\}$ function

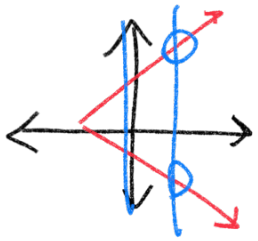
every input → one, only one output

2.) $\{(0,1), (1,1), (2,1), (1,2)\}$ not function

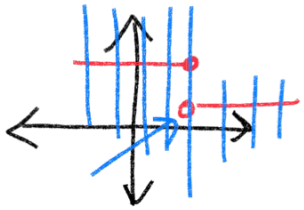
3.) 

function



4.) 

not function

5) 

function

$\{f(x) = y\}$

1.) $f(-2) = 4$ 2.) $f(5) = 4$

3) $f(0) = 0$ 4.) $f(x) = 0$

$x = -4, 0, 4$

5. $f(f(5)) =$

$f(4) = \boxed{0}$

$f(x) = 2x - 3$ $\quad g(x) = 4 - x^2$

$f(3) + g(8)$

$2(3) - 3 + 4 - (8)^2$

$6 - 3 \qquad 4 - 64$

$3 + (-60) = \boxed{-57}$

$\dfrac{g(4)}{f(6)} = \dfrac{4 - (4)^2}{2(6) - 3}$

$\dfrac{4 - 16}{12 - 3} = \dfrac{-12}{9}$

$\boxed{\dfrac{-4}{3}}$

Restrictions

$\dfrac{g(x)}{f(x)}$

Denominators $\neq 0$

Square Roots (Even)

$\dfrac{\sqrt{x - 4}}{3x + 6}$

$f(x) \neq 0$

$2x - 3 \neq 0$

$+3 \quad +3$

$\dfrac{2x}{2} \neq \dfrac{3}{2}$

$\boxed{x \neq \frac{3}{2}}$

$3x + 6 \neq 0$

$-6 \quad -6$

$\dfrac{3x}{3} \neq \dfrac{-6}{3}$

$\boxed{x \neq -2}$

$x - 4 \geq 0$

$+4 \quad +4$

$\boxed{x \geq 4}$

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

$f(g(x)) = 2(4 - x^2) - 3$

$8 - 2x^2 - 3 = \boxed{-2x^2 + 5}$

$f(x) = x^2 + 2x - 7$ $\quad g(x) = \boxed{5 + x}$

$f(g(x)) = (5+x)^2 + 2(5+x) - 7$

$(5+x)(5+x) + 2(5+x) - 7$

$25 + 5x + 5x + x^2 + 10 + 2x - 7$

$\boxed{x^2 + 12x + 28}$

$g(f(2))$

$f(2) = (2)^2 + 2(2) - 7$

$4 + 4 - 7 = 8 - 7 = 1$

$g(1) = 5 + 1 = \boxed{6}$

Even functions

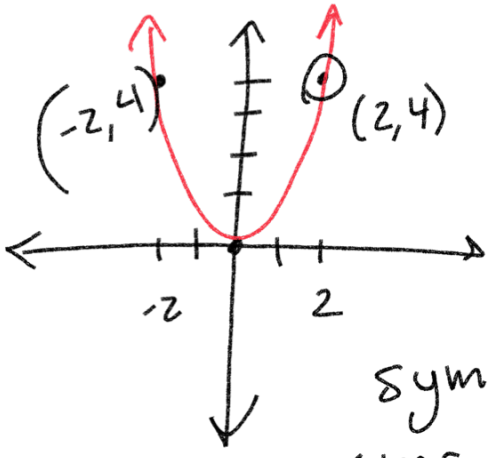
$f(-x) = f(x)$

$f(2) = 4$

$f(-2) = 4$

$f(-2) = f(2)$

$f(x) = x^2$ ← exponents are even numbers



symmetrical over y-axis

$f(x) = x^6 - x^2$

$f(2) = f(-2)$

$f(2) = (2)^6 - (2)^2$

$64 - 4 = 60$

$f(-2) = (-2)^6 - (-2)^2$

$64 - 4 = 60$

$x^4 + 3x^2 + 5x^0$ even

Odd functions

$f(x) = x^3$ ← odd exponents

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

$f(-2) = -f(2)$

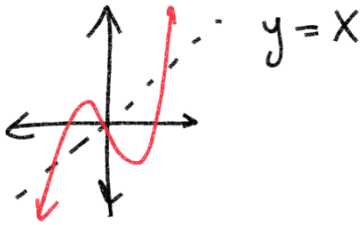
$-8 = -(8)$

$-8 = -8$

$f(2) = 2^3 = 8$

$f(-2) = (-2)^3 = -8$

symmetrical about $y = x$



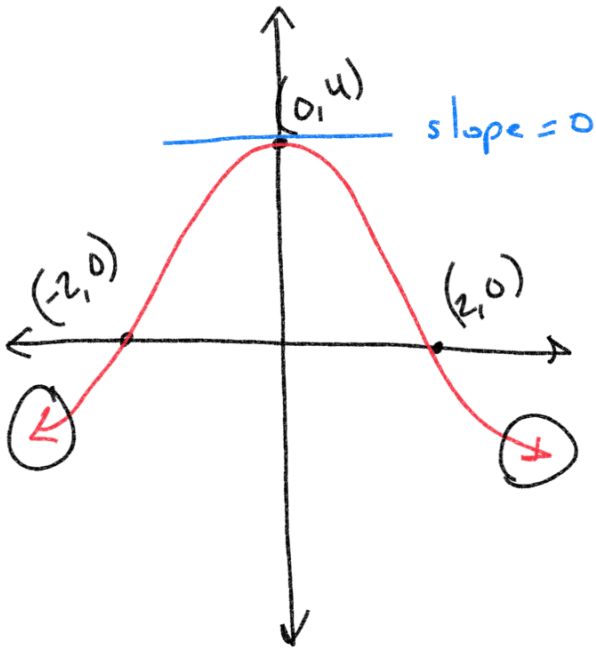
1.) $x^{10} + x^6$ even

2.) $x^9 + x^1$ odd

3.) $x^3 + 7x^0$ neither

$x^3 + 7$

4.) $x^4 + x^3$ (even, odd) neither



positive slope

increasing: $(-\infty, 0)$

decreasing: $(0, \infty)$

negative slope

constant: $(x = 0)$

Domain: $\{\mathbb{R}\}$

x values $(-\infty, \infty)$

Range: $\{-\infty, 4]$

y values