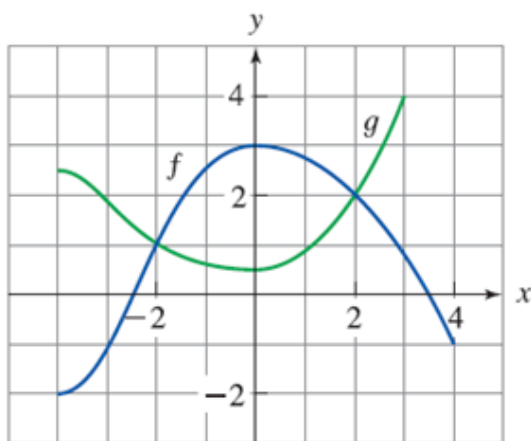




-4 -3 -2 .

$f \leq g$ on
 $[-4, -2] \cup [2, 3]$

$$\begin{matrix} & 1 & \\ & \diagdown & \diagup \\ 1 & 2 & 3 \\ & \diagup & \diagdown \end{matrix}$$

(i)

$$(2+b)^3 = 2^3 + 3 \cdot 2^2 b + 3 \cdot 2 b^2 + b^3$$

$$\begin{aligned} V(r) &= \frac{4}{3}\pi r^3 \Rightarrow V(r+3) - V(r) \\ &= \frac{4}{3}\pi (r+3)^3 - \frac{4}{3}\pi r^3 \\ &= \frac{4}{3}\pi [r^3 + 3(r^2)(3) + 3(r)(3)^2 + 3^3 - r^3] \\ &= \frac{4}{3}\pi [9r^2 + 27r + 27] \end{aligned}$$

$$f(x) = \frac{x+4}{x^2-25}$$

$\Rightarrow$ Need $x^2-25 \neq 0$

$$(x-5)(x+5) \neq 0$$

$$\Rightarrow x \neq \pm 5$$

$$\Rightarrow \mathcal{D} = \mathbb{R} \setminus \{\pm 5\}$$

$$= \{x \mid x \neq \pm 5\}$$

$$= \{x \mid x \neq 5 \text{ and } x \neq -5\}$$

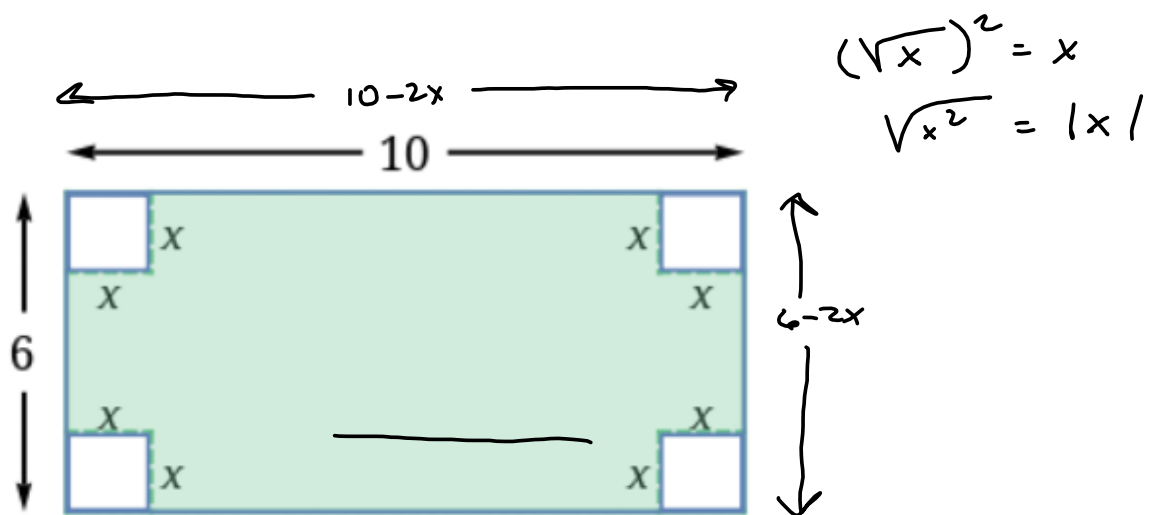
$$= (-\infty, -5) \cup (-5, 5) \cup (5, \infty)$$

$$x^2 \neq 25$$

$$\sqrt{x^2} = \sqrt{25}$$

$$|x| = 5$$

$$x \neq \pm \sqrt{25}$$



$$(\sqrt{x})^2 = x$$

$$\sqrt{x^2} = |x|$$

$$\begin{aligned}
 V &= lwh = (10-2x)(6-2x)x \\
 &= (2x-10)(2x-6)x \\
 &= 4(x-5)(x-3)x \\
 &= 4x(x^2-8x+15) \\
 &=
 \end{aligned}$$

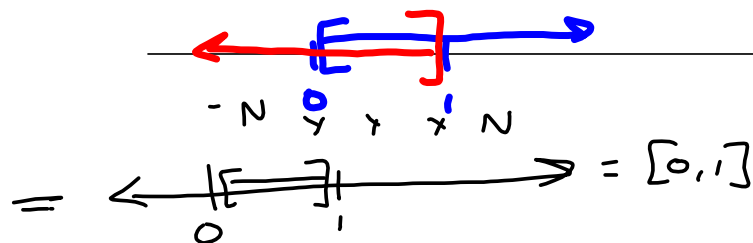
Computer Algebra System (CAS): Maple,

Mathematica, Matlab

$$f(x) = \sqrt{x} + \sqrt{1-x}$$

For $D(f)$, we need $x \geq 0$ & $1-x \geq 0$
 $\Rightarrow 1 \geq x$
 $\Rightarrow x \leq 1$

$$x \geq 0 \text{ and } x \leq 1$$



ODD : $f(-x) = -f(x)$

EVEN : $f(-x) = f(x)$

$$\frac{x}{x+1} = f(x)$$

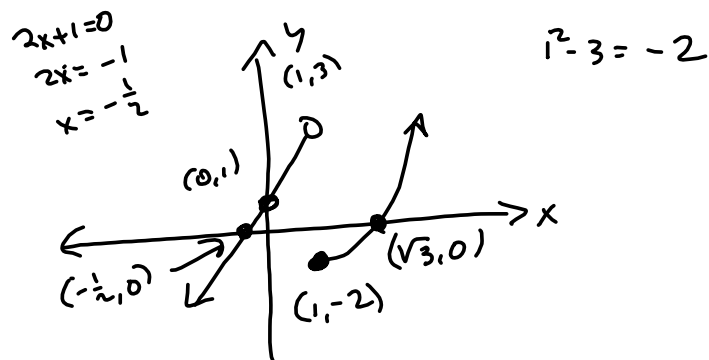
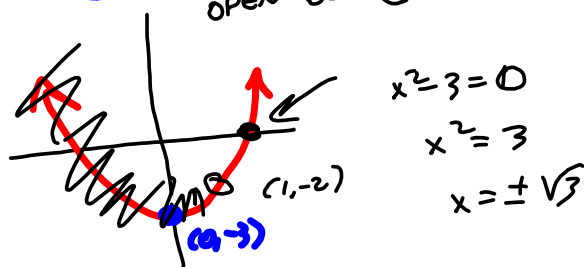
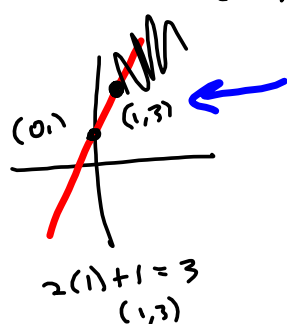
$$f(-x) = \frac{-x}{-x+1} = \text{Neither}$$

$$= \frac{-x}{-(x-1)} = \frac{x}{x-1}$$

Piecewise-defined functions

$$f(x) = \begin{cases} 2x+1 & \text{if } x \leq 1 \\ x^2-3 & \text{if } x > 1 \end{cases}$$

OPEN DOT @ $x=1$



Section 1.3 resources: Basic functions. Shifting, stretching and reflecting.

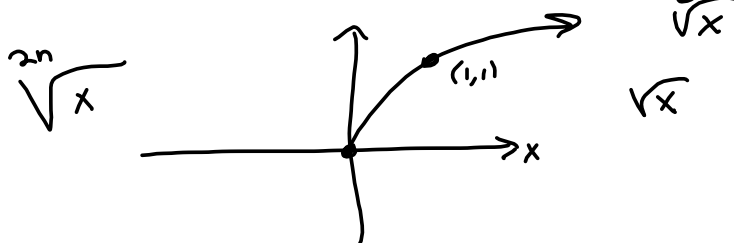
<https://harryzaims.com/121-all/videos/03-Writing-Projects/Writing-Project-2/>



$$1, x, x^{2n}, x^{2n+1}$$

$$\frac{1}{x}, \frac{1}{x^2}, \frac{1}{x^3}, |x|$$

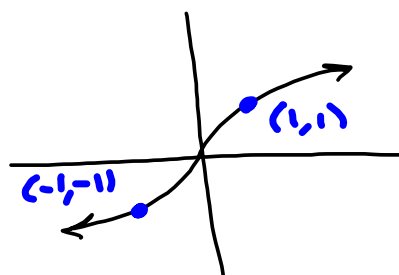
$$\sqrt{x}, \sqrt[3]{x}, \sqrt[2n]{x}, \sqrt[2n+1]{x}$$



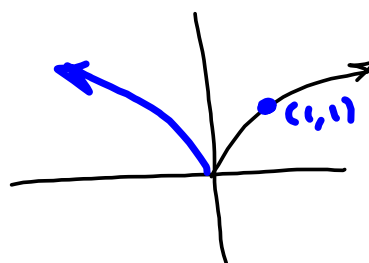
even
odd

$$x^{\frac{2}{3}}$$

$$x^{\frac{1}{3}} = \sqrt[3]{x}$$



$$x^{\frac{2}{5}}$$

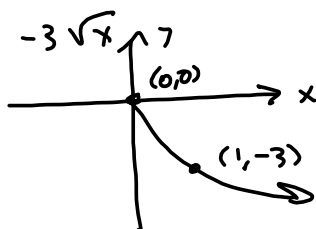
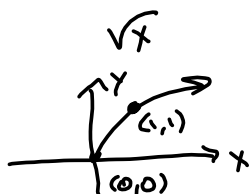


Graph $g(x) = -3\sqrt{5x-10} + 7$

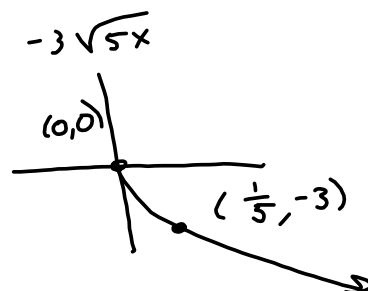
$f(x) = \sqrt{x}$

$af(x) \rightarrow af(bx) \rightarrow af(b(x-c))$

$\rightarrow af(b(x-c)) + d$



$y \rightarrow -3y$



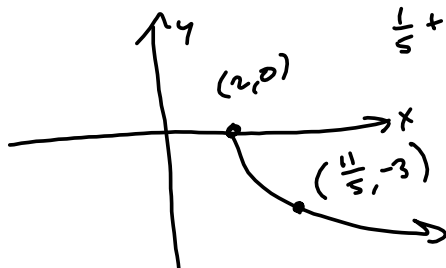
$x \rightarrow \frac{1}{5}x$

Graph $g(x) = -3\sqrt{5x-10} + 7$

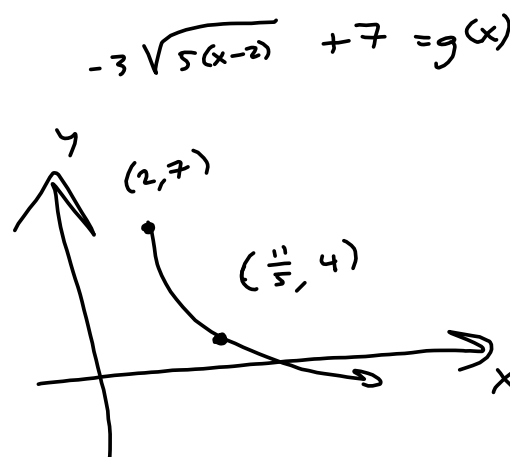
$5(x-2)$

$-3\sqrt{5(x-2)}$ A Delay!

$x \rightarrow x+2$



$\frac{1}{5} + 2 = \frac{1+10}{5} = \frac{11}{5}$



$g(x) = -3\sqrt{5x-10} + 7$

$= -3\sqrt{5(x-2)} + 7$

Basic knowledge of $f(x) = \sqrt{x}$

flip

Right 2

up 7

