$f(x+h) \neq f(x)+h$

Quick Drills

$(x+h)^2 = x^2+2xh+h^2$

$(a-b)^2 = a^2-2ab+b^2$

$(a+b)^2 = a^2+2ab+b^2$

$(x-3)^2 = x^2-2(3)x+3^2 = x^2-6x+9$

$(2x+5)^2 = (2x)^2+2(2x)(5)+5^2 = 4x^2+20x+25$

$(2x-7)^2 = 4x^2-28x+49$

Yesterday: Finish $\lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$ ✓

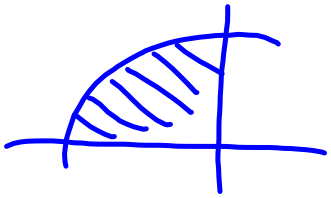
I mixed it up. This isn't 'til Section 2.1. But I always hit it in Week 1, so y'all know kinda what Calculus is.

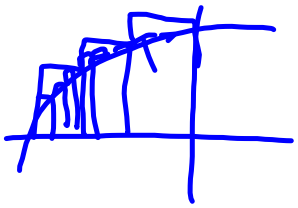
Rep. Functions
- Verbal
- Numerical
- Graphical
- Algebraically

Evaluating

D & R ✓

$\frac{nn}{0}$ Bad $\sqrt{\text{negative}}$ Bad





1.1

Piecewise-Defined Funcs

Line segment. Lines.

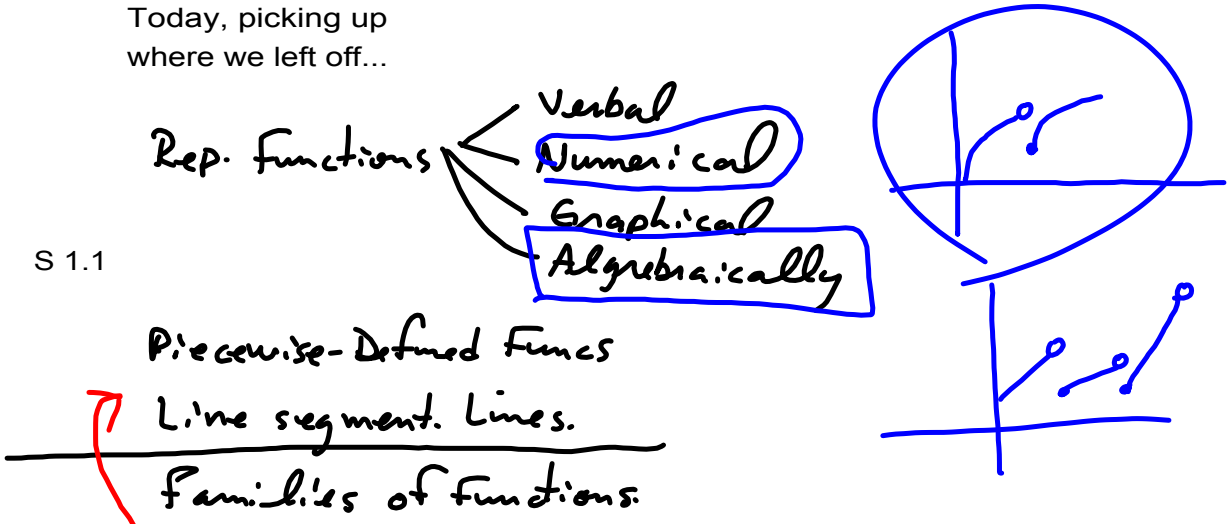
Families of functions.

1.2

Lines

Power Funcs

Today, picking up where we left off...



S 1.1

S 1.2

Swap Order

Lines
Power Funcs

I'm not certain you'd say this fits in Section 1.2. I just knew I wanted to give a take on these guys before requiring Section 1.1 homework.

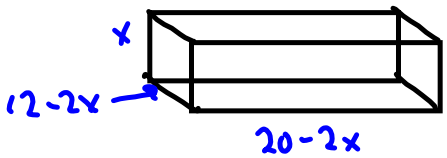
S 1.3

A bit about trig function graphs.
Domain of sum/difference/product of two functions
Domain of quotient of two functions
Domain of the Composition of two Function.
Evaluating a composite function from table/graph of two functions

§1.1 #10 I did only outside area.
It has an inside, idiot.
So, double my answer.
Cardboard Thickness is negligible

V

#11



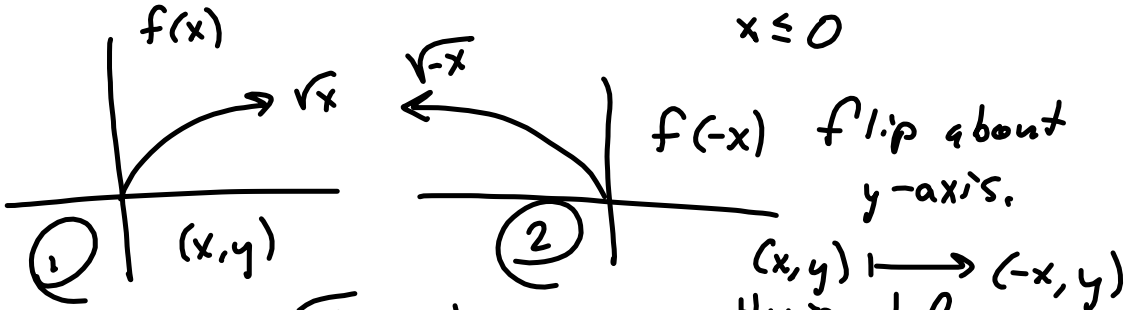
New?

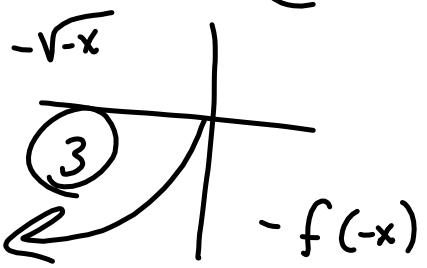
$V = x^2(20-2x)(12-2x)$

$\sqrt{-x}$ what?!

No big: Need $-x \geq 0$, so

$x \leq 0$





~~Points are~~

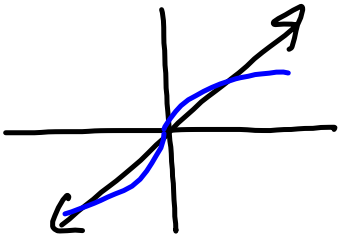
From $f(-x)$ to $-f(-x)$

Changed only y-values from previous pic.

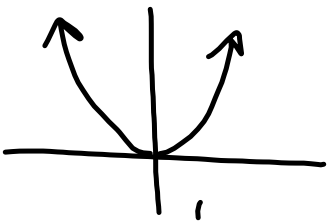
$(x,y) \longmapsto (x,-y)$

① Basic Funcs: Lines, power funcs

$f(x) = x$



$f(x) = x^{2n} = x^{\text{even}}$



x^{265182}

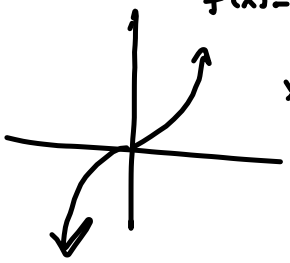
$x^{\frac{1}{\text{even}}} = x^{\frac{1}{2n}}$, $x^{\frac{1}{2}} = \sqrt{x}$

$\sqrt[2n]{x}$

$\sqrt[4]{x}$

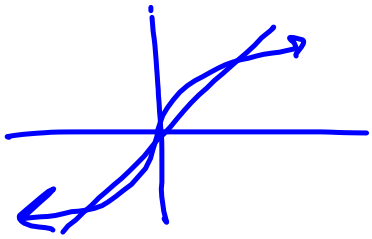
even-index root.

$f(x) = x^{2n+1}$



x^3, x^{15}

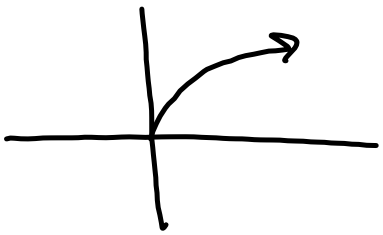
$x^{\frac{1}{\text{ODD}}} = x^{\frac{1}{2n+1}}$



Taller Than $y = x$ if $-1 < x < 1$

Shorter .. .. .. $|x| > 1$

$x^{\frac{\text{odd}}{\text{even}}}$, $x^{\frac{3}{8}}$, where odd < even

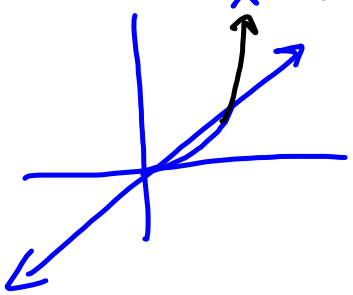


$x^{\frac{7}{8}}$

Like $\sqrt{x}$

what about when odd > even?

$x^{\frac{5}{4}} = \sqrt[4]{x^5}$



$\sqrt[4]{-6}$ ain't real.

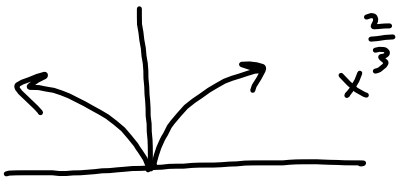
like x^2 or x^3, but nothing left of $x=0$.

$x^{\frac{\text{even}}{\text{even}}}$ reduce the fraction, silly.

Bleah

$x^{\frac{\text{even}}{\text{odd}}}$ ① even < odd

$x^{\frac{2}{5}} = \left(x^{\frac{1}{5}}\right)^2$

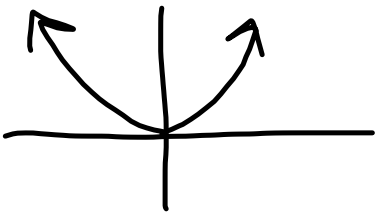


$x^{\frac{2}{3}}$

$-3\left(x-5\right)^{2/3}$

$x^{\frac{\text{even}}{\text{odd}}}$ ② even > odd

$x^{\frac{4}{3}}$



Kinda like x^2, x^4, x^{2n}, again.

Moving functions around

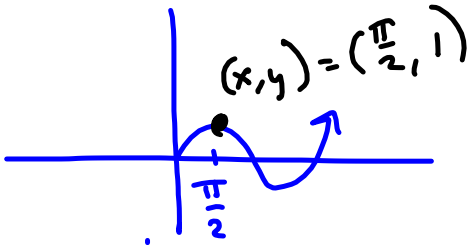
$y = \sin x$

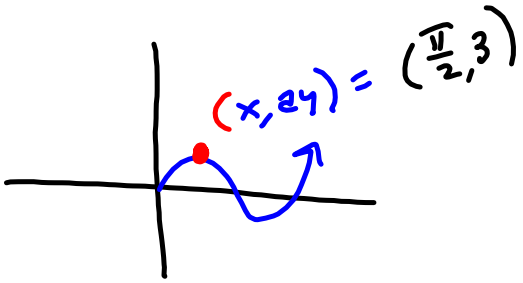
$f(x)$

$y = 3\sin x$

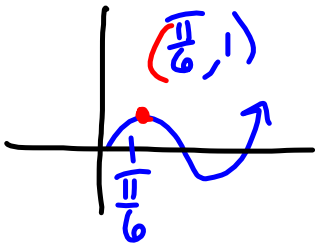
$2f(x)$

$(x, y) \mapsto (x, 3y)$





$f(2x) = \sin(3x)$

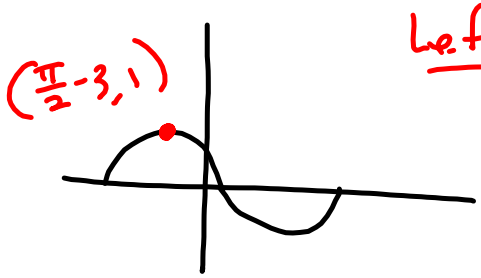


$(x, y) \mapsto (\frac{1}{3}x, y)$

He got there quicker!

$f(x+a) = f(x+3) = \sin(x+3)$

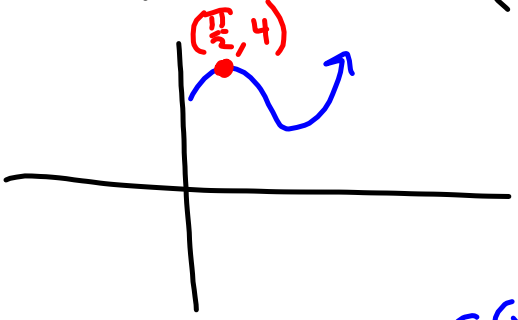
Left 3



$f(x-3)$ Right 3
(A Delay)

$f(x)+a = \sin(x)+3$

up 3



$g(x) = -2(x-5)^{\frac{2}{3}} + 7$