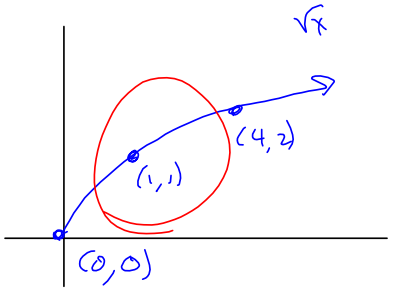
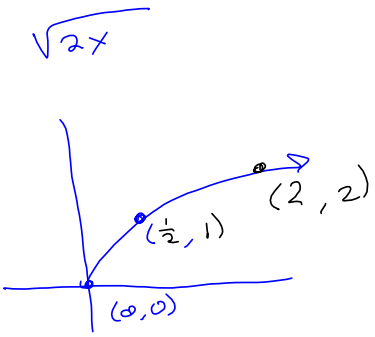
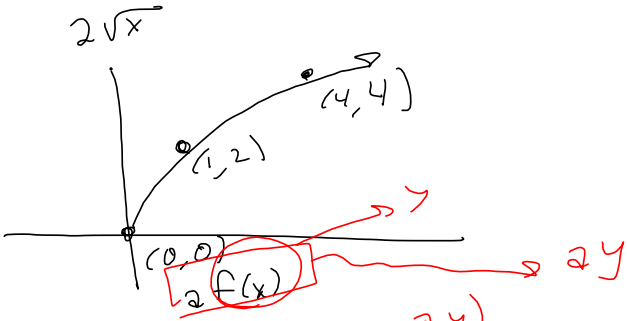




$f(bx)$

$(x,y) \longmapsto (\frac{1}{b}x, y)$

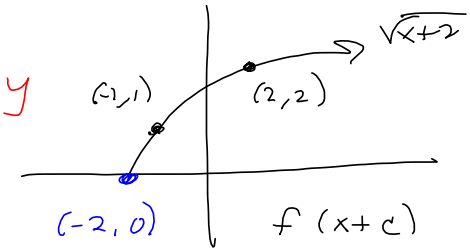
$(1,1) \longmapsto (\frac{1}{2}, 1)$



$(x,y) \longmapsto (x, 2y)$

$(1,1) \longmapsto (1,2)$

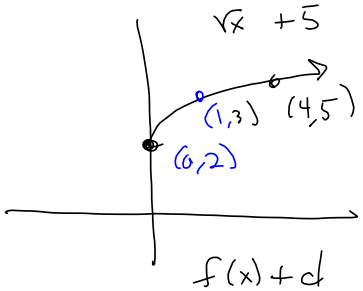
$2f(x)$



$f(x+c)$

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

$(4,2) \longmapsto (2,2)$

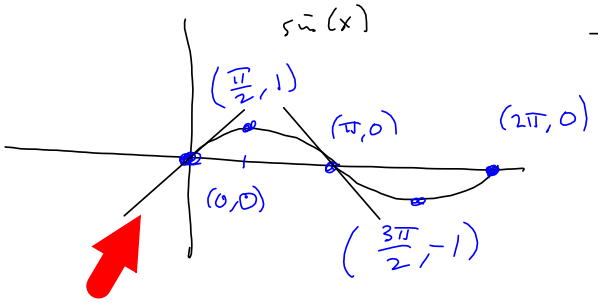


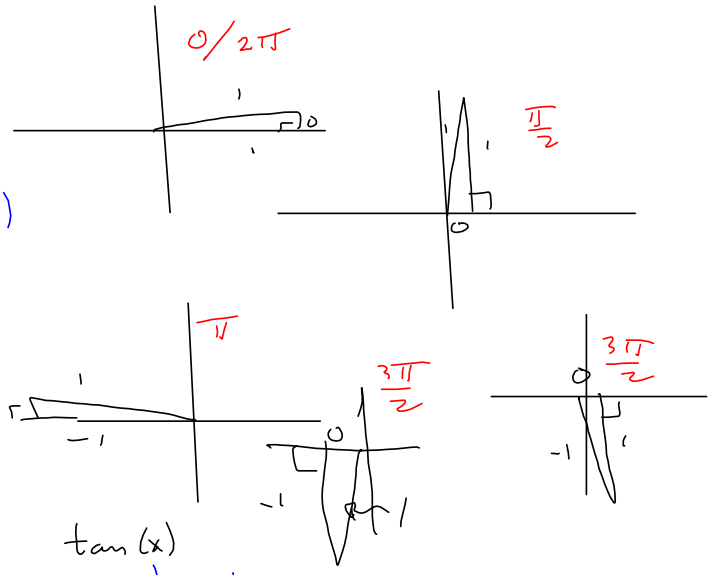
$f(x)+d$

$(x,y) \longmapsto (x, y+d)$

$(1,1) \longmapsto (1,2)$

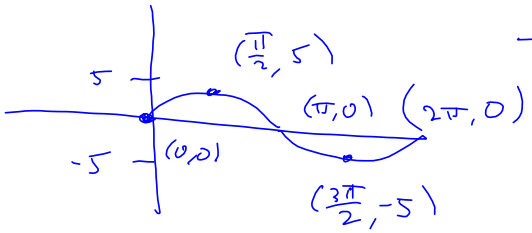
Basic Graphs



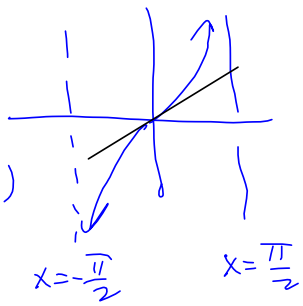


Amplitude = 2 =
Distance from midline to the peak.

5 sin(x)

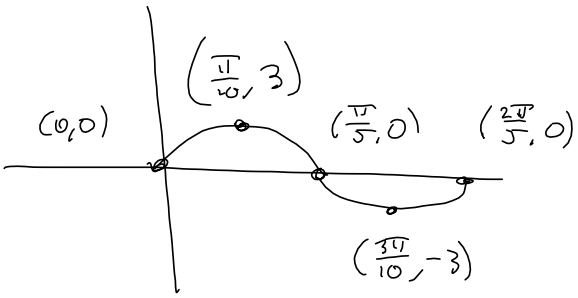


tan(x)



Period of sine is 2π
" " $\sin(5x)$ " $\frac{2\pi}{5}$

3 sin(5x)



$g(x) = 17 \sin\left(\frac{\pi}{7}x - \frac{13\pi}{7}\right) + 50$

$\frac{\pi}{7}x - \frac{13\pi}{7}$

$= \frac{\pi}{7}(x - 13)$

$\frac{7}{\pi} \cdot x$ RIGHT 13

Tricky part

$3x+5 = 3\left(\frac{3x}{3} + \frac{5}{3}\right)$

$= 3\left(x + \frac{5}{3}\right)$

$x \mapsto \frac{1}{3}x$ Then shift $\frac{5}{3}$ left

$\frac{\frac{13\pi}{7}}{\frac{\pi}{7}} = \frac{13\pi}{7} \cdot \frac{7}{\pi} = 13$

START @ $x = 13$

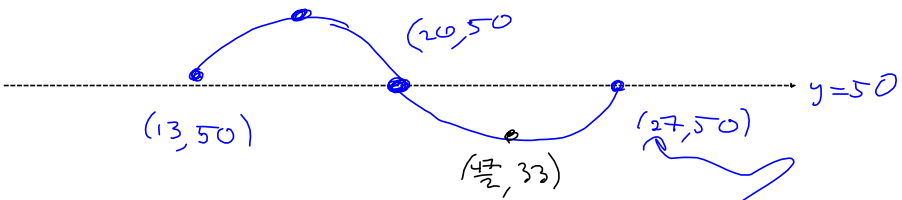
$g(x) = 17 \sin\left(\frac{\pi}{7}(x-13)\right) + 50$

$y = 50$ is midline

Amplitude $(50+17, 50-17)$ 30

$\frac{2\pi}{\frac{\pi}{7}} = 2\pi \cdot \frac{7}{\pi} = 14 = T =$ Period.

From 50+17 $(\frac{33}{2}, 67)$



$\frac{14}{4} = \frac{7}{2}$ = increment

$13 + \frac{7}{2} = \frac{26+7}{2} = \frac{33}{2}$

$\frac{33}{2} + \frac{7}{2} = \frac{40}{2} = 20$

$\frac{40}{2} + \frac{7}{2} = \frac{47}{2}$

$\frac{47}{2} + \frac{7}{2} = \frac{54}{2} = 27$

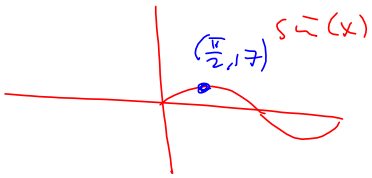
$\sin(-5x)$

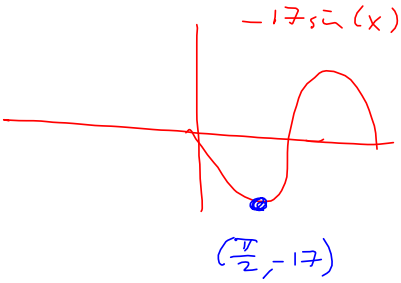
$(x,y) \longmapsto (-\frac{1}{5}x, y)$

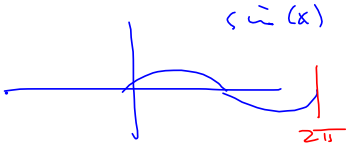
Horizontal Flip.

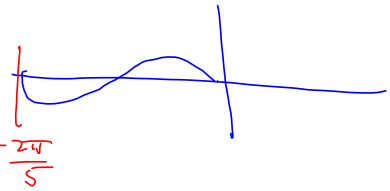
$-17\sin(x)$

$(x,y) \longmapsto (x, -17y)$









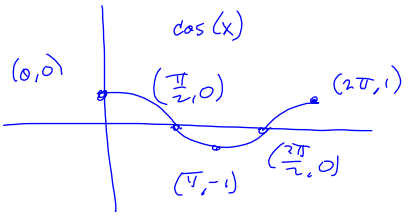
Feb 5-8:56 AM

Build a cosine function from HIGH & Low info.

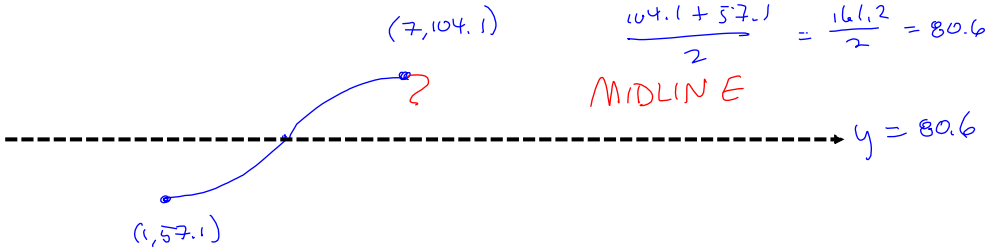
5.5 # 89 (1, 57.1) ← start @ the low?
(7, 104.1)

↓ flip it!

$-a\cos(bx+c)+d$

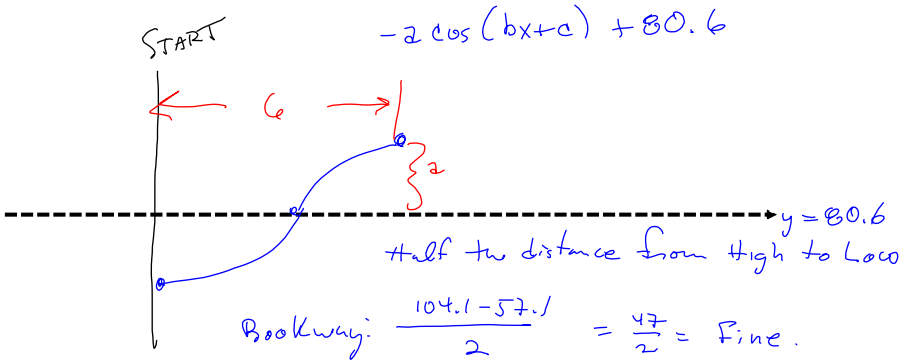


HIGH: 104.1
Low: 57.1



$\frac{104.1+57.1}{2} = \frac{161.2}{2} = 80.6$ MIDLINE

$-2\cos(bx+c)+80.6$



Half the distance from High to Low

Bookway: $\frac{104.1-57.1}{2} = \frac{47}{2}$ = Fine.

104 − 57 = 47

Lois says: $104.1 - 80.6 = 23.5$

$-23.5\cos(bx+c)+80.6$

$=-\frac{47}{2}\cos(bx+c)+80.6$

START AT $x=1$:

$-\frac{47}{2}\cos(b(x-1))+80.6$

Period of cosine is 2π

" " weather is 12

Want $bx = 2\pi$ when $x = 12$

$b = \frac{2\pi}{12} = \frac{\pi}{6} = \frac{\pi}{\frac{1}{2}\text{-Period}}$

$$g(x) = -\frac{47}{2}\cos\left(\frac{\pi}{6}(x-1)\right)+80.6$$

Feb 5-9:00 AM

$\sin(x)^2 + 1.28\sin(x) - 0.4185$

Find all solutions in $[0, 2\pi)$ in ~~degrees~~ radians (and degrees) to 3 decimal places.

$a = 1, b = 1.28, c = -.4185$

$b^2 - 4ac = (1.28)^2 - 4(1)(-.4185) = 3.7124$

$\sin(x) = \frac{-1.28 \pm \sqrt{3.7124}}{2}$

$1.28^2 - 4 \cdot 1 \cdot (-.4185)$

3.3124

$\frac{(-1.28 + \text{sqrt}(3.3124))}{2 \cdot 1}$

0.2700000000

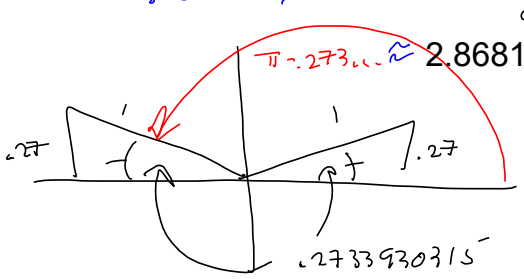
$\frac{(-1.28 - \text{sqrt}(3.3124))}{2 \cdot 1}$

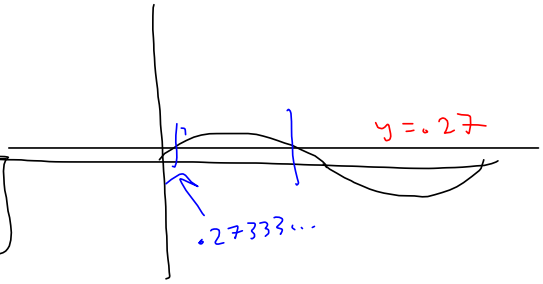
−1.550000000

$\sin(x) = .27$

$\arcsin(.27) \approx .2733930315$ radians!

$\pi - .273... \approx 2.868199622$





Radians: $x \approx .273, 2.868$

All solns $\{ .273 + 2n\pi$ OR $2.868 + 2n\pi \mid n \in \mathbb{I} \}$