(a) $m=4$ $\longrightarrow$ $y=4x+b$

(b) $f(4)=1$

$y=m(x-4)+1$

$=mx-4m+1$

$y-1=m(x-4)=mx-4m$

$\Longrightarrow y=mx-4m+1$

(c) $mx-4m+1=4x+b$

Want $m=4$, so

$=4x-4(4)+1$

$=4x-15$ to be in this family

My version: $m=2$ in (a)

(b) $y=mx-2m+1$

(c) $m=2 \Longrightarrow y=2x-4+1=2x-3$

$y = 3\sqrt{x+3}$

$x \mapsto x-3$

$y \mapsto 3y$

Methods of graphing by transforming:

To graph $af(bx-c)+d$ from $y=f(x)$.

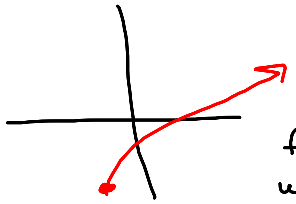
M1

1. $af(x)$
2. $af(x-c)$
3. $af(bx-c)$
4. $af(bx-c)+d$

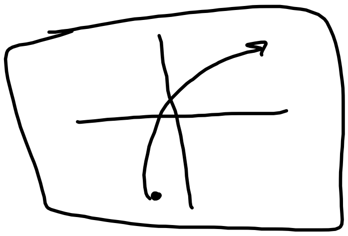
M2

1. $af(x)$
2. $af(bx)$
3. $af\left(b\left(x-\frac{c}{b}\right)\right)$
4. $af\left(b\left(x-\frac{c}{b}\right)\right)+d$

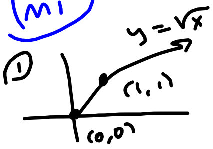
Graph: $y = 7\sqrt{5x+20} - 13 = 7\sqrt{5(x+4)} - 13 = f(x)$



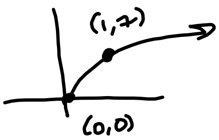
f(0) decides which



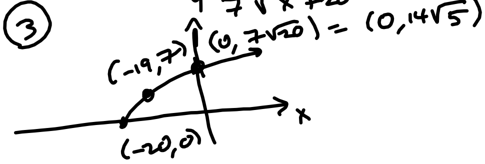
M1

1. 

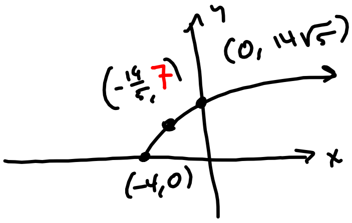
2. $y = 7\sqrt{x}$



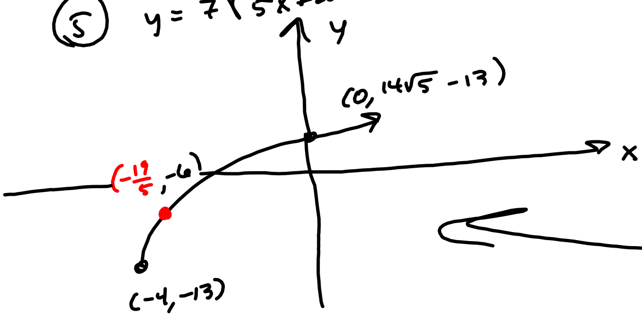
3. y $7\sqrt{x+20}$



4. $y = 7\sqrt{5x+20}$

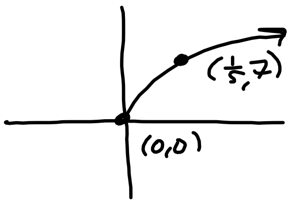


5. $y = 7\sqrt{5x+20} - 13$



M2 1, 2 Same

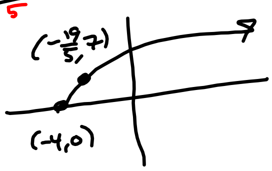
3. $y = 7\sqrt{5x}$



4. $5x+20 = 5(x+4)$

$7\sqrt{5(x+4)}$

$\frac{1}{5} - 4 = \frac{1-20}{5} = \frac{-19}{5}$



5. $y = 7\sqrt{5(x+4)} - 13$

Same as this

§1.2 #11

(70, 113)

(80, 183)

Let $x =$ temp (°F)

& $y =$ # of chirps per minute

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{183-113}{80-70} = \frac{70}{10} = 7 = m$$

$$y = 7(x-70)+113$$
$$= 7x - 490 + 113$$
$$= 7x - 377$$

No, silly! They're trying to model temp as a function of the # of cricket chirps per minute!

(113, 70)

(183, 80)

Lexicon

List variables

and their units.

Let $N =$ # of cricket chirps per minute

$T =$ Temp (°F) as a function of N $(T = T(N))$

OR

(y) $T =$ Temp (°F) as a function of — OUTPUT Dependent variable

(x) $N =$ # of cricket chirps per minute — Independent variable INPUT

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{T_2 - T_1}{N_2 - N_1} = \frac{80-70}{183-113} = \frac{10}{70} = \frac{1}{7}$$

$$T = \frac{1}{7}(N - 113) + 70$$
$$= \frac{N}{7} - \frac{113}{7} + 70\left(\frac{7}{7}\right)$$
$$= \frac{N}{7} - \frac{113}{7} + \frac{490}{7} = \frac{N}{7} + \frac{377}{7}$$

$7 \overline{)113}$ 1