

a) $y = 2 \cos \frac{\pi}{6} t + 3$

$Pd = 12$

$Amp = 2$

$\frac{2\pi}{b} = 12$

$VS = 3$

b.) $12am \rightarrow 2:30pm$

$12b = 2\pi$

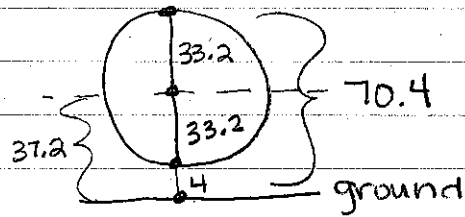
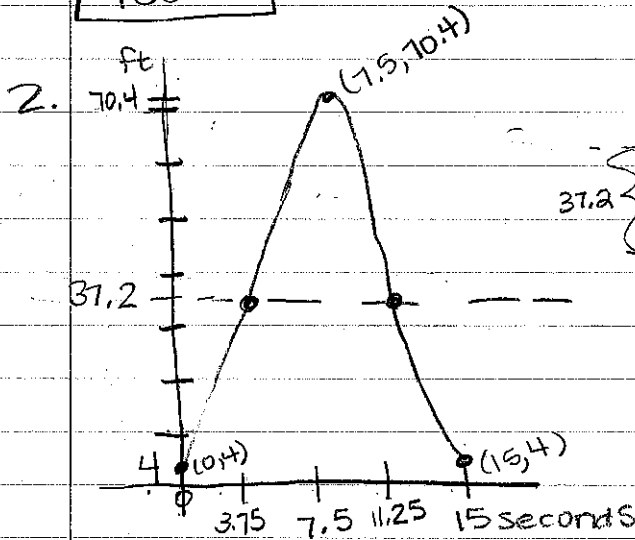
$t = 14.5 \text{ hrs}$

$b = \frac{\pi}{6}$

3.5 ft

c.) add eq: $y = 4$

$10am$



$33.2 + 33.2 + 4 = 70.4$

$Pd = 15$

$A = 33.2$

$\frac{2\pi}{b} = 15$

$VS = 37.2$

$15b = 2\pi$

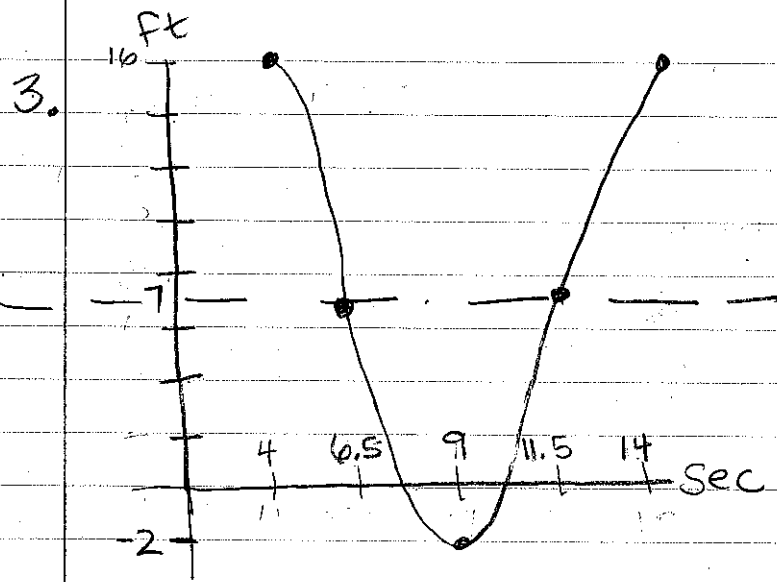
$b = \frac{2\pi}{15}$

a.) $y = -33.2 \cos \frac{2\pi}{15} t + 37.2$

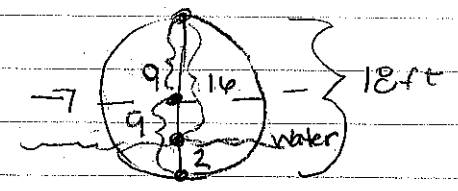
b.) 69.7 ft

c.) add eq: $y = 27$

3 sec

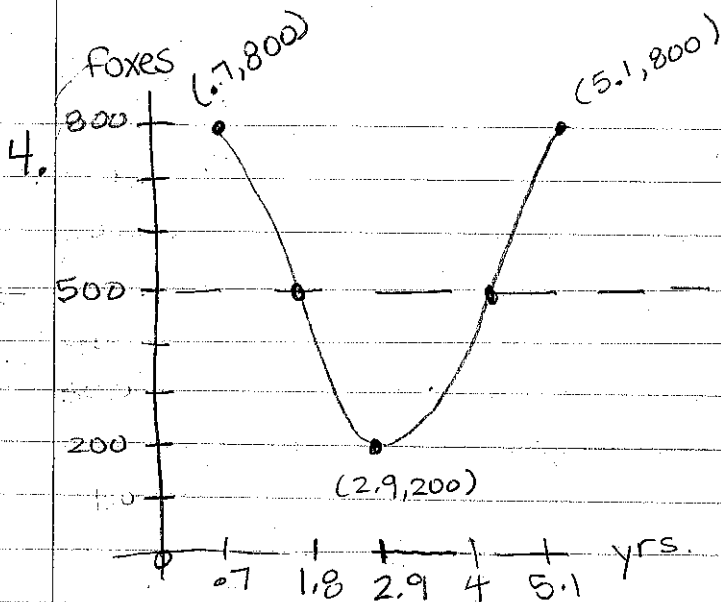


$$\begin{aligned}
 Pd &= 10 & A &= \frac{16 - (-2)}{2} \\
 \frac{2\pi}{b} &= 10 & &= \frac{18}{2} \\
 10b &= 2\pi & &= 9 \\
 b &= \frac{\pi}{5} & &= 9
 \end{aligned}$$



$$HS = 4 \quad VS = 7$$

- a.) $y = 9 \cos \frac{\pi}{5} (t - 4) + 7$
- b.) -2 ft; part of the wheel is under water.
- c.) 4.2 ft
- d.) .08 seconds; it's coming out of the water.



$$d = \frac{200 + 800}{2} = 500$$

$$5.1 - 2.9 = 2.2$$

$$2.9 - 2.2 = .7 \text{ (other max)}$$

$$5.1 - .7 = 4.4 = \text{period}$$

$$\frac{2\pi}{b} = 4.4$$

$$b$$

$$4.4b = 2\pi$$

$$b = \frac{5\pi}{11}$$

a) $y = 300 \cos \frac{5\pi}{11}(t - .7) + 500$

b)

t	y
7	227
8	337
9	726
10	726

* Always round down,

don't have enough

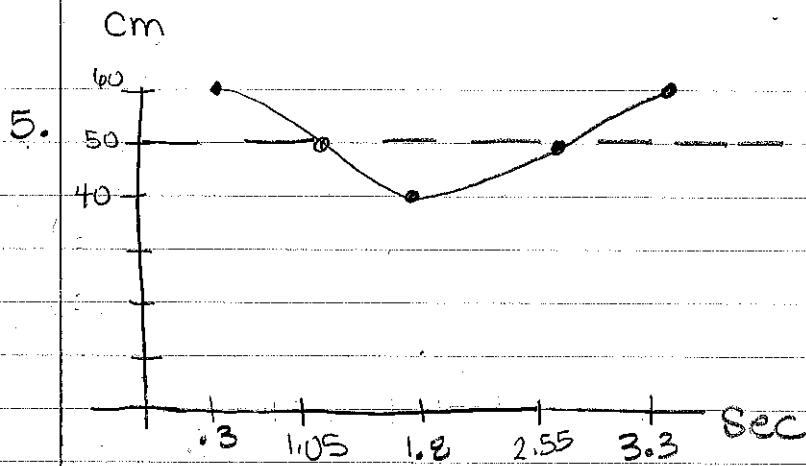
body parts to round up. 😞

$$ps = .7$$

$$vs = 500$$

$$\text{Amp} = 800 - 500 = 300$$

c) Odd eq: $y = 300$
 $2.3 \text{ yrs} \rightarrow 3.5 \text{ yrs}$



$$D = \frac{40 + 60}{2} = 50$$

$$1.8 - 0.3 = 1.5$$

$$1.8 + 1.5 = 3.3 \text{ (other max)}$$

$$\text{Amp} = 60 - 50 = 10$$

$$pd = 3.3 - 0.3 = 3$$

$$3 = \frac{2\pi}{b}$$

$$3b = 2\pi$$

$$b = \frac{2\pi}{3}$$

$$ps = 0.3$$

$$vs = 50$$

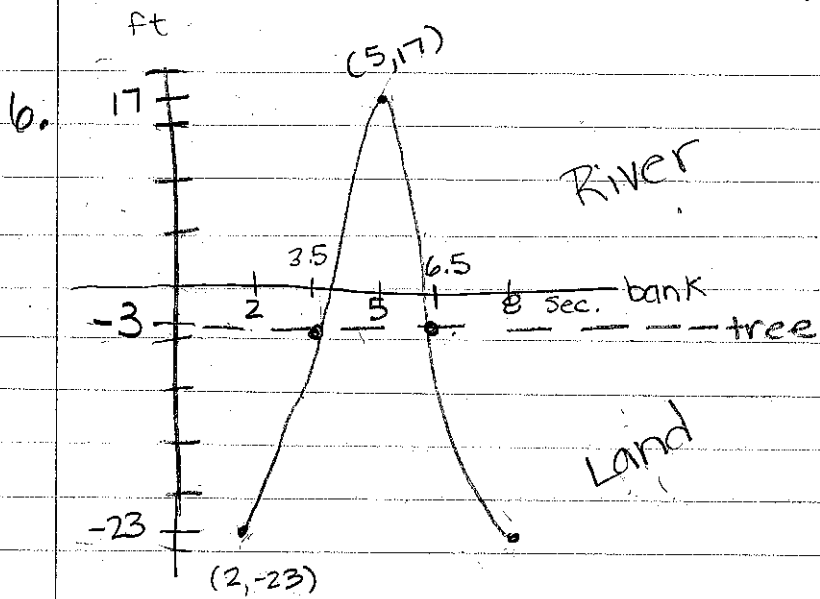
a.) $y = 10 \cos \frac{2\pi}{3} (t - 0.3) + 50$

b.) 43.3 cm

c.) 58.1 cm

d.) 0.08 sec

(add eq: $y = 59$)



$$5 - 2 = 3$$

$$3 + 5 = 8 \text{ (other min)}$$

$$D = \frac{-23 + 17}{2} = -3$$

$$A = 17 - (-3) = 20$$

*reflects x-axis

$$ps = 2$$

$$vs = -3$$

$$pd = 8 - 2 = 6$$

$$b = \frac{2\pi}{b}$$

$$6b = 2\pi$$

$$b = \pi/3$$

a.) $y = -20 \cos \frac{\pi}{3}(t-2) - 3$

b.) -16.4 ft (land)

c.) $.4 \text{ sec}$ - it's the x-int

d.) -3 ft → it's the vertical shift/location of tree.

7. a.) $pd = \frac{1948 - 1750}{18} = \boxed{11 \text{ yrs}}$

b.) $A = \frac{110 - 10}{2} = 50$

$Vs = \frac{10 + 110}{2} = 60$

$Pd = 11$

$\frac{2\pi}{b} = 11$

$11b = 2\pi$

$b = \frac{2\pi}{11}$

$y = 50 \cos \frac{2\pi}{11}(t) + 60$

In calc window:

$y \text{ min} = -2$

$y \text{ max} = 120$

$y \text{ scale} = 10$

$x \text{ min} = 250$

$x \text{ max} = 280$

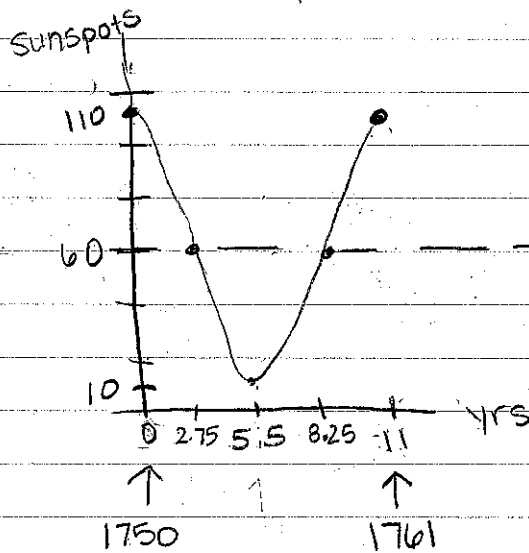
$x \text{ scale} = 10$

c.) $\boxed{12 \text{ sunspots}}$

d.) add eq $y = 35$
 $\boxed{2021}$

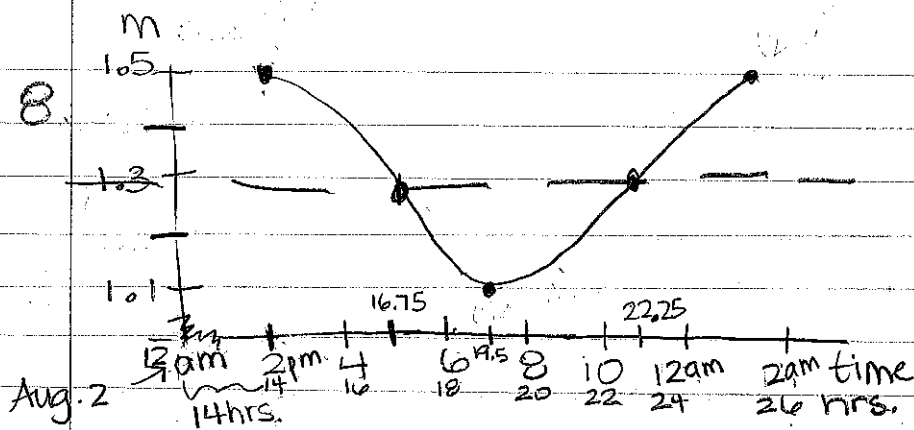
e.) $\boxed{2025}$ $1750 + 275$

270 yrs =
2020



← in case you want to see it graphed 😊

another max → 1948



$$7.5 - 2 = 5.5$$

$$7.5 + 5.5 = 13 \text{ (other max)}$$

$$d = \frac{1.5 + 1.1}{2} = 1.3$$

$$A = 1.5 - 1.3 = 0.2$$

$$Pd = 13 - 2 = 11$$

$$11 = \frac{2\pi}{b}$$

$$11b = 2\pi$$

$$b = \frac{2\pi}{11}$$

a.) $y = .2 \cos \frac{2\pi}{11} (t - 14) + 1.3$

b.) 1.1 m

Let $x = 41$ hrs (Aug. 2 = 24 hrs; Aug 3 = 17 hrs)

c.) $6:30 \text{ am}$

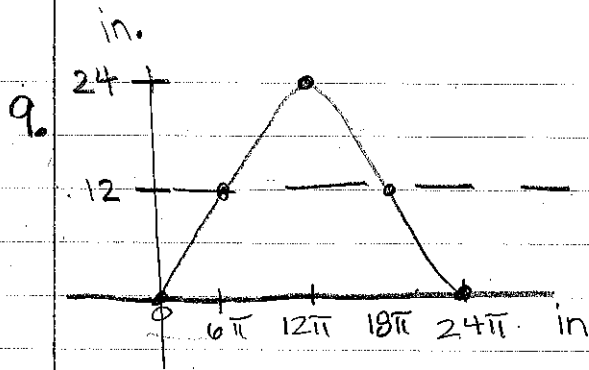
(after 24 hrs, so $x = 30.5$ hrs)

$$Ps = 14$$

$$Vs = 1.3$$

d.) $4:00 \text{ am}$

add eq: $y = 1.27$ (after 24 hrs, so 28 hrs)



$$C = 2\pi r$$

$$C = 2\pi (12)$$

$$C = 24\pi$$

$$D = \frac{0 + 24}{2} = 12$$

$$A = 24 - 12 = 12$$

* reflects x-axis

PS = None

$$VS = 12$$

$$\text{Period} = 24\pi$$

$$\frac{2\pi}{b} = 24\pi$$

$$24\pi b = 2\pi$$

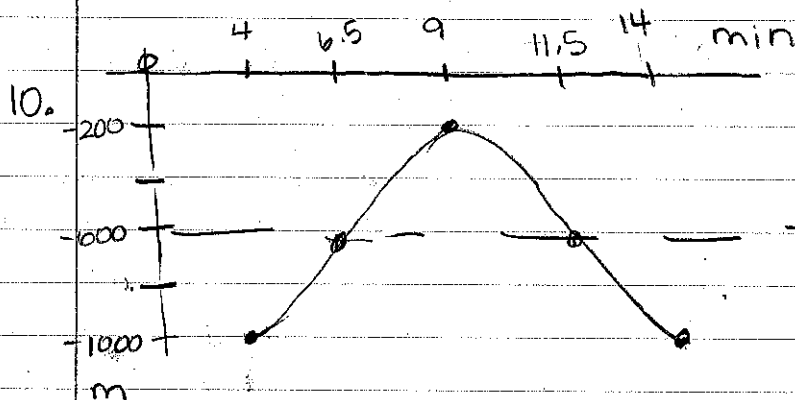
$$b = \frac{1}{12}$$

a.) $y = -12 \cos \frac{x}{12} + 12$

b.) 18.2 in

c.) $17.8 \text{ in} \ \& \ 57.5 \text{ in}$

add eq: $y = 11$



$$9 - 4 = 5$$

$$9 + 5 = 14 \text{ (next)}$$

$$D = \frac{-1000 + -600}{2} = -600$$

$$A = -200 - -600 = 400$$

* Reflects x-axis

$$pd = 14 - 4 = 10$$

$$\frac{2\pi}{b} = 10$$

$$10b = 2\pi$$

$$b = \frac{\pi}{5}$$

$$PS = 4$$

$$VS = -600$$

a.) $y = -400 \cos \frac{\pi}{5}(t - 4) - 600$

b.) $(0, -276.4)$

yes, because you are above 300m

c.) $0.15 \text{ min} \ \& \ 7.8 \text{ min}$

or

$9 \text{ sec} \ \& \ 468 \text{ sec}$

add eq: $y = -300$