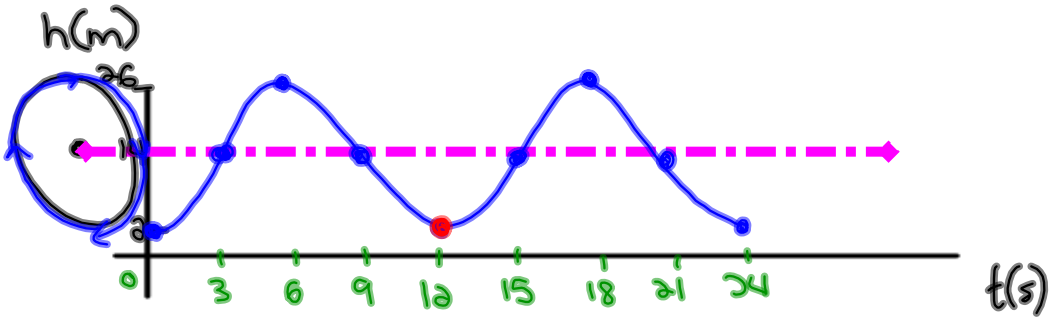
1. A Ferris wheel has a radius of 12m and makes one complete revolution every 12 seconds. The bottom of the wheel is 2m above the ground. *If a person gets on at the bottom and goes up,* determine the following:

a) Amplitude: = 12m b) Period: = 12s c) k: $= \frac{360}{12} = 30$ d) D: = 14m

e) Maximum Height = 26 f) Minimum Height: = 2m

g) Equation: $y = -12\cos[30(x)] + 14$

h) Sketch the graph for two revolutions (periods):



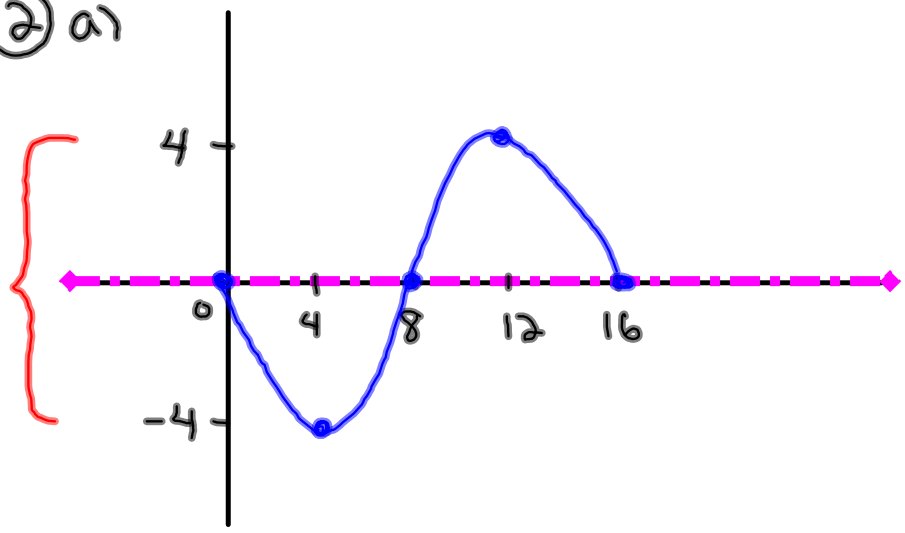
i) How high is the person at these times?

i) 12 seconds = 2m

ii) 5 minutes = 2m

(300s)

② a)



P = 16

K = 22.5

A = 4

D = 0

C = 0

b) $y = -4\sin[22.5(x)]$

3. A water wheel has a radius of 10m. 3m of the wheel is submerged under water. If the wheel makes one revolution in 360 degrees and the bucket starts at the center and goes up, find:

a) $A = 10m$

b) $P = 360°$

c) $k = \frac{360}{360} = 1$

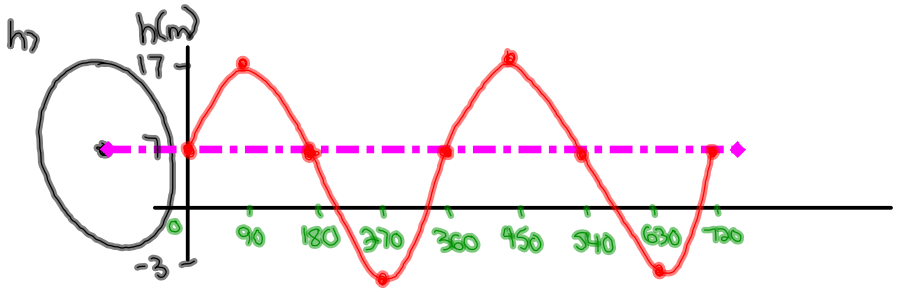
d) $D = 7m$

e) $max = 17m$

f) $min = -3m$

g) $y = 10\sin[1(x)] + 7$

h)



i) ① $40° \rightarrow y = 10\sin[1(40)] + 7$

$y = 13.43m$

② $110° \rightarrow y = 10\sin[1(110)] + 7$

$y = 16.39m$

③ $200° \rightarrow y = 10\sin[1(200)] + 7$

$y = 3.58m$

j) $y = 11$

$11 = 10\sin[1(x)] + 7$

$\frac{4}{10} = \frac{10\sin[x]}{10}$

$* \ 0.4 = \sin x \ *$ $\quad \sin^{-1}(0.4) = 23.58°$

$23.58° = x$

4. A water wheel is defined by the equation $y = 7\cos[18(x)] + 4$

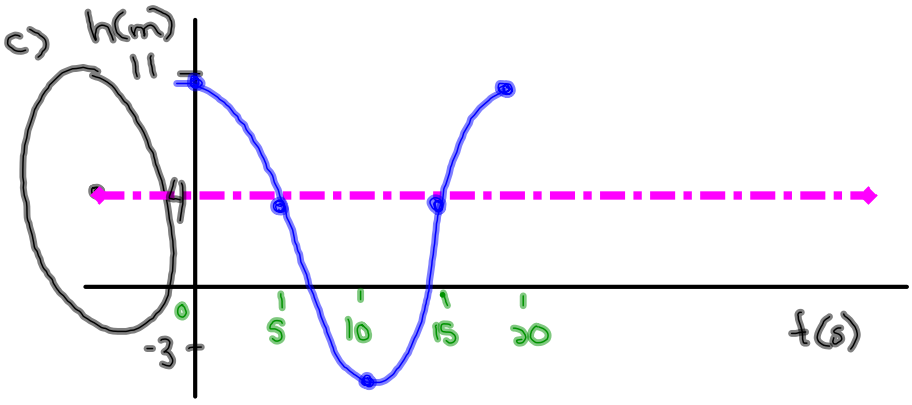
$A = 7$ $\quad K = 18$ $\quad C = 0$ $\quad D = 4$

$P = \frac{360}{18} = 20$

a) Amp $= 7$ $\quad$ max: $4 + 7 = 11$

b) Period $= 20$ $\quad$ min: $4 - 7 = -3$

c)



d) 3m is submerged

e) Radius = Amp = 7

f) $y = 7\cos[18(x)] + 4$

$5 = 7\cos[18x] + 4$

$\frac{1}{7} = \frac{7\cos(18x)}{7}$

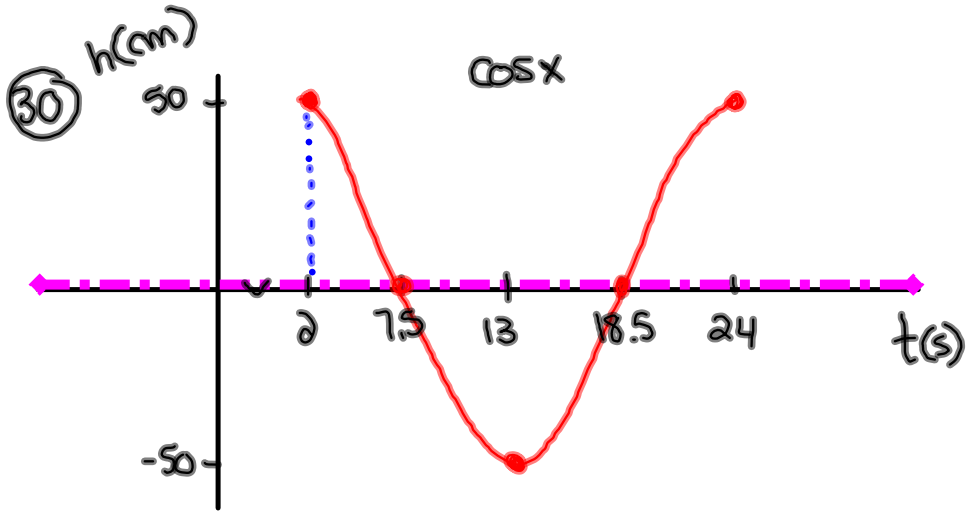
$0.1428 = \cos(18x)$

$\cos^{-1}(0.1428) = 18x$

$\frac{81.8}{18} = \frac{18x}{18}$

$4.5s = x$

(30)



$A = 50$

$P = 22$

$k = 16.36$

$C = 2$

$D = 0$

a) $y = 50\cos[16.36(x-2)]$

b) $y = \underline{15}\cos[16.36(x-2)]$ * $50 \times 0.3 = 15$