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

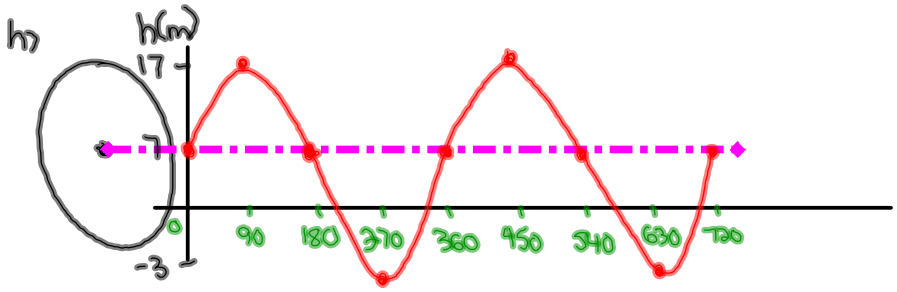
d) $D = 7m$

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) $y = 11$

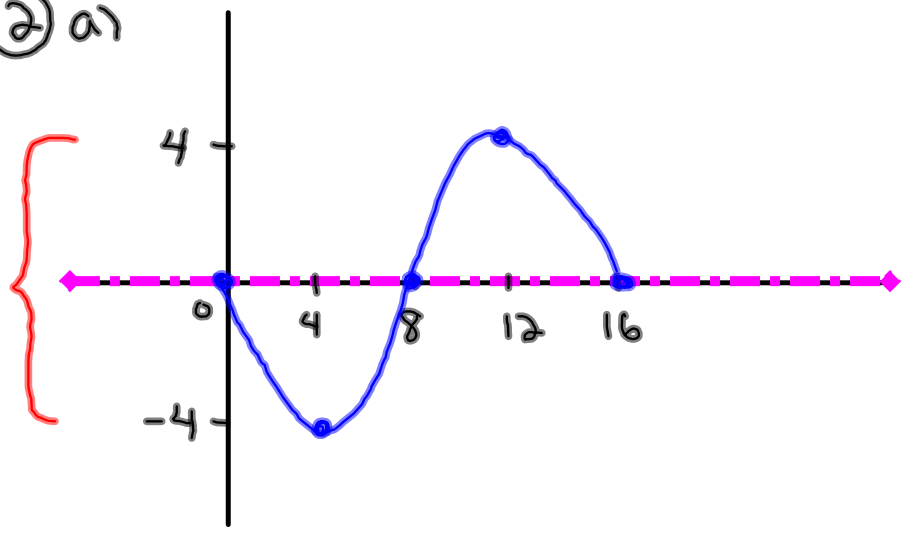
$11 = 10\sin[1(x)] + 7$

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

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

$23.58° = x$

② a)



P = 16

K = 22.5

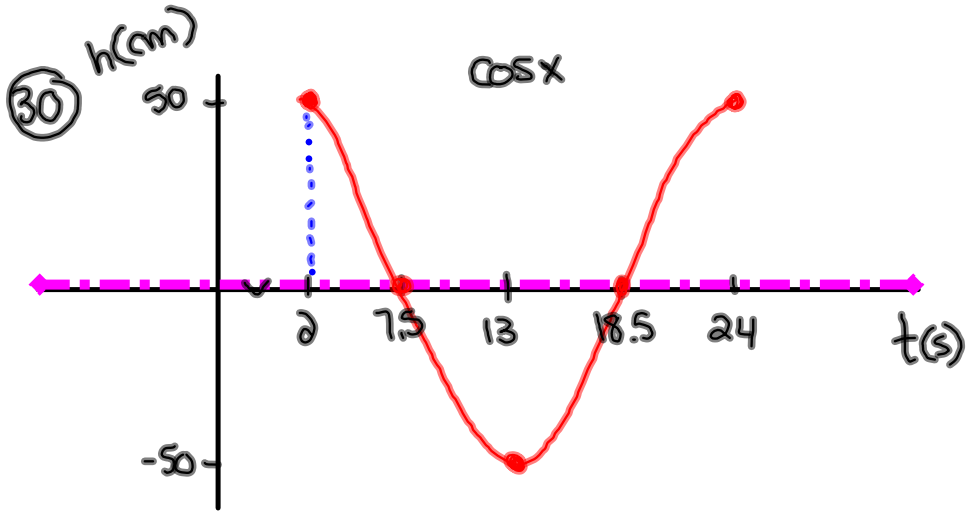
A = 4

D = 0

C = 0

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

(30)



$A = 50$

$P = 22$

$k = 16.36$

$C = 2$

$D = 0$

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

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

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

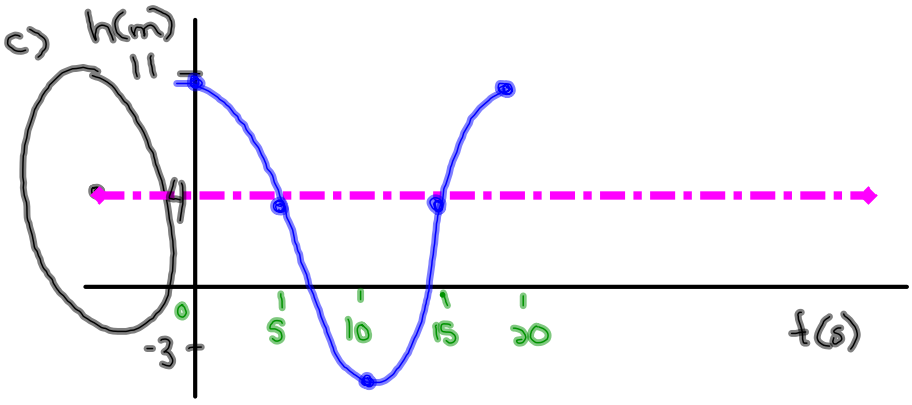
$A = 7$ $\quad K = 18$ $\quad C = 0$ $\quad D = 4$

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

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

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

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

$0.1428 = \cos(18x)$

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

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

$4.5s = x$