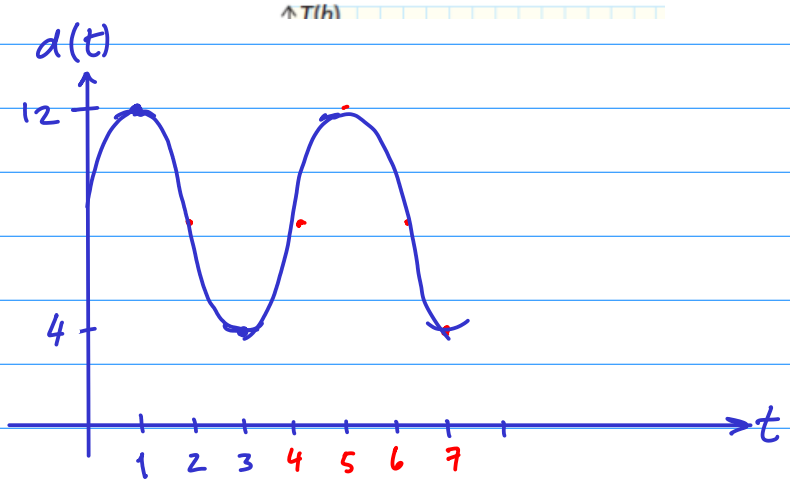
3. Chantelle is swinging back and forth on a trapeze. Her distance from a vertical support beam in terms of time can be modelled by a sinusoidal function. At $1s$, she is the maximum distance from the beam, $12m$. At $3s$, she is the minimum distance from the beam, $4m$. Determine an equation of a sinusoidal function that describes Chantelle's distance from the vertical beam in relation to time.

Interior and Exterior Temperature
T(h)

A graph is not necessary, but it helps.



1s → 3s = 2s, is half of a period, so the period = 4s.

A of C: $y = \frac{\max + \min}{2}$

$y = \frac{12+4}{2}$

$y = 8$

$|a| = \frac{\max - \min}{2}$

$|a| = \frac{12-4}{2}$

$|a| = 4$

$k = \frac{360°}{\text{period}}$

$= \frac{360°}{4}$

$= 90°$

for $p = 0$, unreflected sine → $a = +4$

$$d(t) = 4\sin(90°t) + 8$$

OR

$$d(t) = 4\cos[90°(t-1)] + 8$$