Part 1: Wave Maths

CORE

1. A = Maximum distance from the rest distance
   T = Period of time it takes from one crest to another.
   f = Frequency is the inverse of T
   w = Angular velocity is the amount of rotation it undergoes in a certain period of time
   λ = The wavelength is the distance ~~taken~~ between two consequtive crests in metres.
   v = The velocity of the wave.

2. $y = A\sin(kx \pm \omega t + \phi)$

   $y = A\sin\left(kx \pm \dfrac{2\pi t}{T} + \phi\right)$

   $y = A\sin\left(\dfrac{2\pi x}{\lambda} \pm \dfrac{2\pi t}{T} + \phi\right)$

COMPLETION

3. $A = 5m$
   $\omega = \dfrac{2\pi}{T}$

   $6T = 2\pi$
   $T = \dfrac{2\pi}{6} s$ $f = \dfrac{1}{\frac{2\pi}{6}} = \dfrac{6}{2\pi} = \dfrac{3}{\pi} Hz$

   $2 = \dfrac{2\pi}{\lambda} \Rightarrow \lambda = \pi$ Direction to the ~~left~~ right.

   $v = f\lambda$
   $= \dfrac{3}{\pi} \times \pi = 3 m/s$

4. $f = 1200\,Hz$
$v = 340\,m/s$
$A = 1$
$\phi = 0$

$k = \dfrac{2\pi}{\lambda}$

$v = f\lambda$
$\lambda = \dfrac{v}{f} = \dfrac{340}{1200} = 0.283$

$k = \dfrac{2\pi}{0.283} = 22.3 \;(3sf)$

$\omega = \dfrac{2\pi}{T}$

$T = \dfrac{1}{f} = 0.0008333333$

$\omega = 7539.8\,rad/s$

$y = \sin(22.3x \pm 7539.8x)$

PART 2 : A TO D AND D TO A

<u>CORE</u>

1. Measure the voltage and write it down reading voltage and write it as a number.
- Camera
- Speakers.

2. Range: Range of voltages system can read $-10V$ to $10V$.

Rate: Voltage readings per second
$$S\,s^{-1} \; per \; second$$

Resolution: Precision of measurement specified in bits.