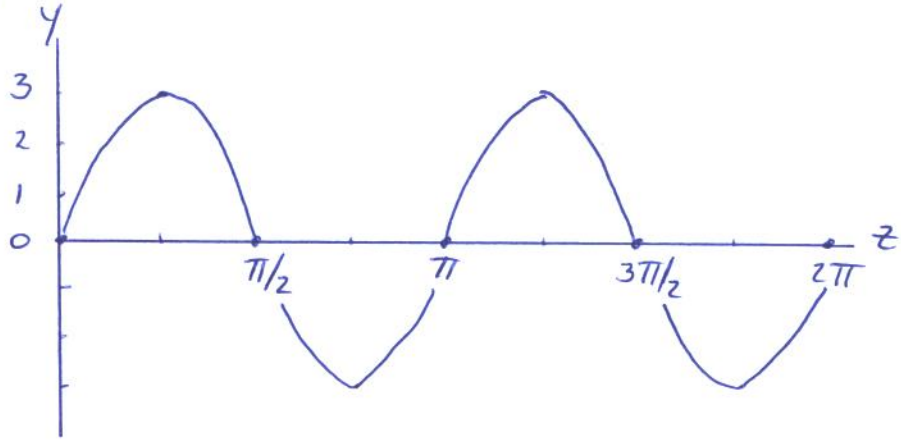
Quiz 7

Name: _____ Student Number: _____

1. Consider the wave $y = 3 \sin (2z - 4t)$. Units are in meters and seconds.

a) (1 mark) Neatly draw the wave as a function of position at time $t = 0$.

$y(t=0) = 3 \sin 2z$



b) (1 mark) What is the amplitude?

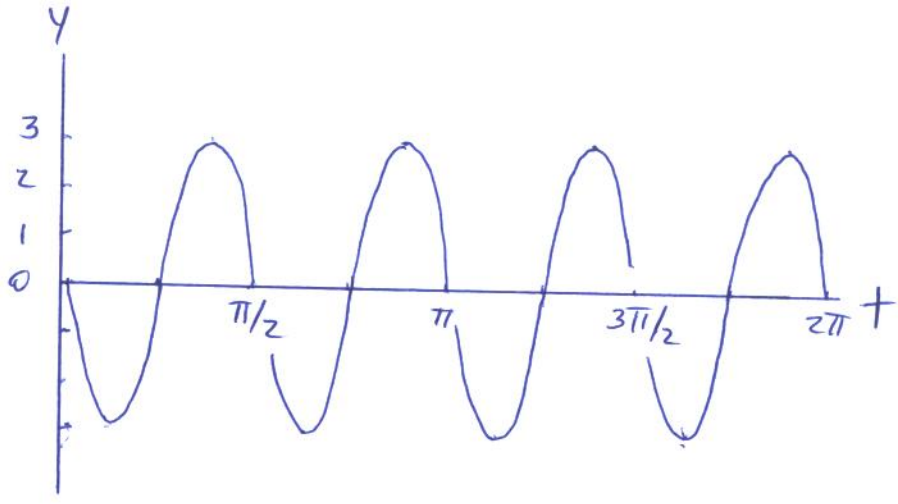
Amplitude = 3 m

c) (1 mark) What is the wavelength?

Wavelength = π meters

d) (1 mark) Neatly draw the wave as a function of time at position z = 0.

$y(z=0) = -3 \sin 4t$



e) (1 mark) What is the period?

Period = $\frac{\pi}{2}$ seconds

f) (1 mark) What is the frequency?

Frequency = $\frac{1}{\text{Period}}$

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

g) (1 mark) What is the direction of the wave?

Wave travels in + z direction.

h) (1 mark) What is the phase velocity of the wave?

Phase Velocity = Frequency × Wavelength

$= \frac{2}{\pi}\ Hz \times \pi\ m$

$= 2\ m/sec.$

2. (2 marks) A sound wave travels in air at a frequency of 250 Hz. What is the wave's wavelength?

$\lambda = \frac{\text{speed of sound}}{\text{frequency}}$

$= \frac{330\ m/sec}{250\ Hz}$

$= 1.32\ m.$

Total = 10 marks