

Introduction to Waves

1) A) $A = 2\text{m}$

B) Using troughs, I see a trough @ 0m & another @ 45m \Rightarrow 3 waves in 45m or $\lambda = 15\text{m}$

C) $f = \frac{3 \text{ waves}}{11\text{s}} = 0.27 \text{ Hz}$

D) $T = \frac{1}{f} = \frac{1}{0.27} = 3.7\text{s}$

E) $v = \lambda \cdot f = \left(15 \frac{\text{m}}{\text{wave}}\right) \left(0.27 \frac{\text{waves}}{\text{s}}\right) = 4.0 \frac{\text{m}}{\text{s}}$

2) A) 3m B) 1 wave crest @ 3m another crest @ 51m
8 waves in 48m \Rightarrow $6 \frac{\text{m}}{\text{wave}} \Rightarrow \lambda = 6\text{m}$

C) 7 waves in .56s $\Rightarrow f = \frac{7 \text{ waves}}{.56\text{s}} = 12.5 \text{ Hz}$

D) $T = \frac{1}{f} = \frac{1}{12.5} = 0.08\text{s}$

E) $v = \lambda \cdot f = 6(12.5) = 75 \text{ m/s}$

Intro. to Waves

③ energy & momentum

④ vibration

⑤ A) $\boxed{6m = A}$

B) Using troughs because I can't get 3 troughs but only 2 crests: 1 trough @ 3s
another trough @ 18.8s \Rightarrow

$$f = \frac{2 \text{ waves}}{15.8 \text{ s}} = \boxed{.13 \text{ Hz}}$$

B) $T = \frac{15.8 \text{ s}}{2 \text{ waves}} = \boxed{7.9 \text{ s}}$

D) $\lambda = 24 \text{ m}$

$$v = \lambda \cdot f$$

$$v = 24(.13) = \boxed{3.1 \text{ m/s}}$$

⑥ a) $A = 2.2 \text{ m}$

b) one crest @ 1.6m another @ 20.4m

$$\Rightarrow \lambda = \frac{20.4 \text{ m} - 1.6 \text{ m}}{3 \text{ waves}} = \boxed{6.3 \text{ m}}$$

c) $v = \lambda \cdot f$

$$v = 6.3(.5)$$

$$\boxed{v = 3.2 \frac{\text{m}}{\text{s}}}$$