

**GCSE Physics B (Twenty First Century Science)**  
**J259/01** Breadth in Physics (Foundation Tier)

**Question Set 30**

1

Jane uses a ripple tank to measure the speed of water waves.

- (a) The ripples on the surface of the water in the ripple tank are an example of transverse waves.

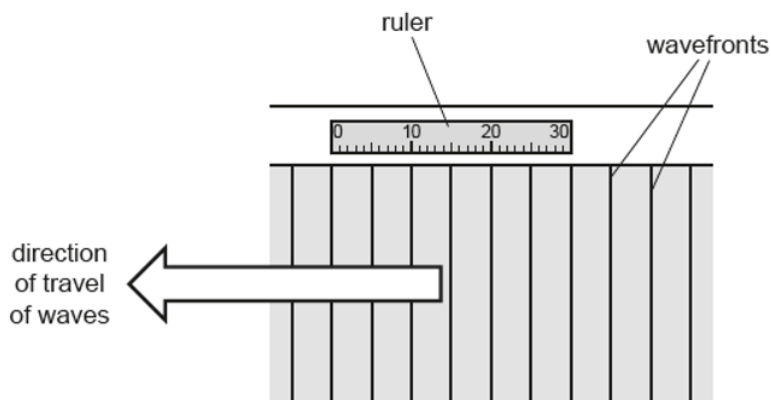
Describe the difference between transverse and longitudinal waves.

[2]

Transverse - oscillations are perpendicular to direction of travel

Longitudinal - oscillations are parallel to direction of travel

- (b) The diagram shows a view of part of the ripple tank from above. Waves are



- (i) The ruler next to the ripple tank is 0.30 m long.  
The ruler is the same length as **6** of the waves.  
Calculate the wavelength of the waves.

$$\lambda = 0.3/6 = 0.05\text{m}$$

Wavelength = ..... **0.05** ..... m [2]

- (ii) Suggest how Jane could use a stopwatch to measure the frequency of the waves in the ripple tank.

[1]

Count number of waves passing in a point in a given time

- (c) Ben measures the wavelength of the waves to be 0.08 m.  
The frequency of the waves is 3.0 Hz.

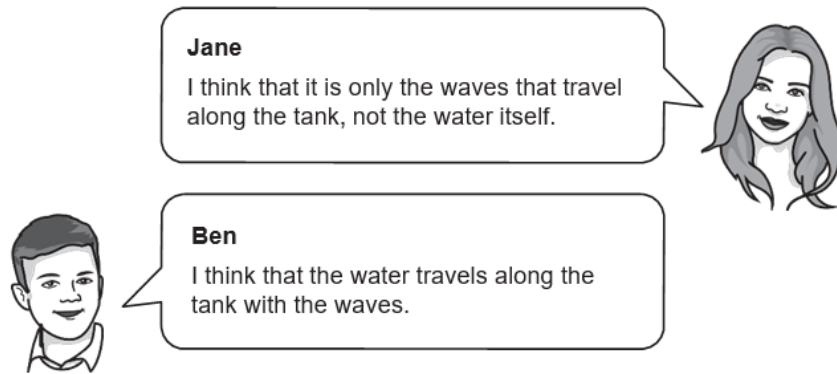
Calculate the speed of the waves that Ben measures.

Use the equation: wave speed = frequency × wavelength

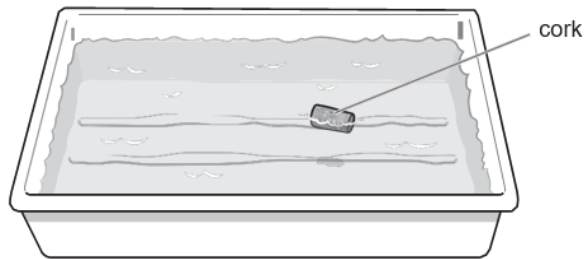
$$v = \lambda f = 3 \times 0.08 = 0.24\text{m/s}$$

Speed = ..... **0.24** ..... m/s [2]

(d) Jane and Ben talk about the experiment.



Jane places a small cork on the water to show Ben that she is correct.



Describe the motion of the cork.

[2]

The cork will move up and down and remain in the same place

**Total Marks for Question Set 30: 9**

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