Wave speed and period

Physics Paper 2 calculations | AQA Combined Science 8464 and AQA GCSE Physics 8463 | 13 questions, 35 marks

GCSE science calculations

Scan for the solutions

Equations for this topic (cover this box to practise recalling them)

- wave speed = frequency × wavelength learn this one
- period = $\frac{1}{\text{frequency}}$ on the physics equation sheet
- distance travelled = speed × time learn this one

Name: _____ **Date:** _____ **Score:** _____ **/ 35**

1 Waves on a boating lake have a frequency of 2 Hz and a wavelength of 0.6 m.

Calculate the speed of the waves.

(2 marks)

Answer _____

2 A wave machine at a leisure centre makes waves with a frequency of 0.5 Hz.

Calculate the period of the waves.

(2 marks)

Answer _____

3 A tuning fork makes a sound wave with a frequency of 680 Hz. The wavelength of the sound in air is 0.5 m.

Calculate the speed of sound in air.

(2 marks)

Answer _____

4 A smoke alarm gives out a sound with a frequency of 2.5 kHz. The wavelength of the sound is 0.132 m.

Calculate the speed of the sound.

(2 marks)

Answer _____

5 Zainab uses a ripple tank in a Year 10 practical. The waves have a frequency of 12 Hz and a wavelength of 1.5 cm.

Calculate the speed of the waves in m/s.

(2 marks)

Answer _____

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6 A bat makes a sound with a frequency of 40 kHz.

Calculate the period of the sound wave. Give your answer in standard form.

(2 marks)

Answer _____

7 A guitar string makes a sound with a frequency of 170 Hz. The speed of sound in air is 340 m/s.

Calculate the wavelength of the sound wave in air.

(2 marks)

Answer _____

8 A local radio station broadcasts on a frequency of 100 MHz. Radio waves travel at 3.0×10^8 m/s.

Calculate the wavelength of the radio waves.

(3 marks)

Answer _____

9 Orange light from a street lamp has a wavelength of 600 nm. Light travels at 3.0×10^8 m/s.

$1 \text{ nm} = 1 \times 10^{-9}$ m

Calculate the frequency of the light. Give your answer in standard form.

(3 marks)

Answer _____

10 Mateo watches waves in a harbour. One wave crest travels 9.0 m along the harbour wall in 6.0 s. The wavelength of the waves is 1.2 m.

a. Calculate the speed of the waves.

b. Calculate the frequency of the waves. Show your working.

(4 marks)

Answer _____

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11 A buoy at sea bobs up and down as waves pass it. The time period of the waves is 4.0 s. The wavelength of the waves is 10 m.

Calculate the speed of the waves. Show your working.

(3 marks)

Answer _____

12 A microwave oven uses microwaves with a frequency of 2.45 GHz. Microwaves travel at 3.0 × 10^8 m/s.

1 GHz = 1 × 10^9 Hz

a. Calculate the wavelength of the microwaves. Give your answer in metres to 2 significant figures.

b. Calculate the period of the microwaves. Give your answer in standard form to 2 significant figures.

Show your working.

(5 marks)

Answer _____

13 Jade makes water waves in a ripple tank. The horizontal distance from a crest to the next trough is 1.5 cm. Each crest is 0.40 cm above the level of still water. The frequency of the waves is 10 Hz.

Calculate the speed of the waves in m/s. Show your working.

(3 marks)

Answer _____

End of questions | Total 35 marks

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