

20 With which types of wave can the Doppler shift be observed?

- A all types of wave
- B light and sound waves only
- C sound waves and water waves only
- D sound waves only

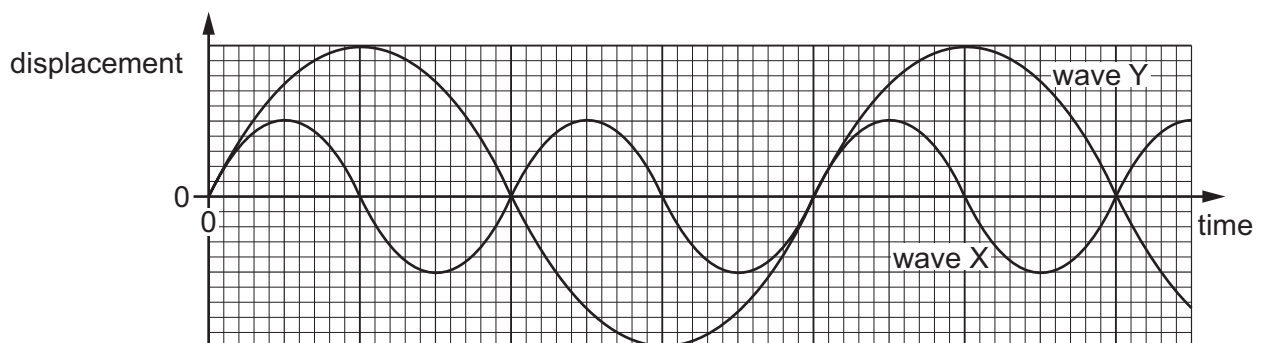
21 A distant star is receding from the Earth with a speed of  $1.40 \times 10^7 \text{ ms}^{-1}$ . It emits light of frequency  $4.57 \times 10^{14} \text{ Hz}$ . The speed of light is  $3.00 \times 10^8 \text{ ms}^{-1}$ .

The Doppler effect formula can be used with light waves.

What will be the frequency of this light when detected on Earth?

- A  $2.04 \times 10^{13} \text{ Hz}$
- B  $4.37 \times 10^{14} \text{ Hz}$
- C  $4.57 \times 10^{14} \text{ Hz}$
- D  $4.79 \times 10^{14} \text{ Hz}$

22 The graph shows the variation with time of the displacement of two separate waves X and Y.



Wave X has frequency  $f$  and amplitude  $A$ .

What is the frequency and what is the amplitude of wave Y?

	frequency	amplitude
A	$\frac{1}{2}f$	$\frac{1}{2}A$
B	$\frac{1}{2}f$	$2A$
C	$2f$	$\frac{1}{2}A$
D	$2f$	$2A$