

- 5 A transverse wave on a rope is travelling to the right. Fig. 5.1 shows the waveform at a particular time. Particles Q, R, S, T, U and V are labelled.

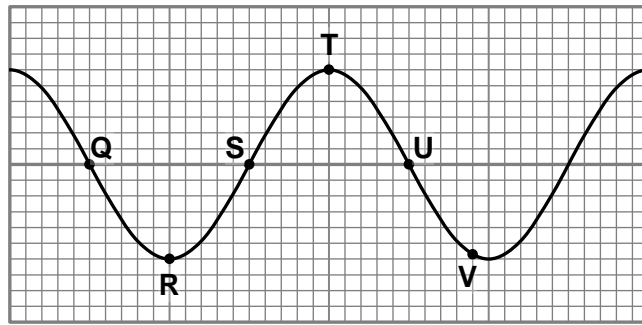


Fig. 5.1

- (a) On Fig. 5.1, indicate using arrows the directions in which the particles Q, S and U are moving. [2]
- (b) State the motion of particles R and T at this instant shown. [1]
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- (c) On Fig. 5.1, mark two particles on the waveform, other than Q, R, S, T and U, that are
- (i) in phase with each other (mark with 'X'),
- (ii) in antiphase with each other (mark with '+'). [2]
- (d) Particle V leads particle U by a phase of ϕ .

Calculate ϕ . Explain your working.

$\phi =$ rad [2]