

15 Doctors can use ultrasound to monitor the heartbeat of a baby when it is developing inside the mother.

- (a) A baby's heart was beating at  $142 \text{ beats minute}^{-1}$ . The wall of the baby's heart was moving with a maximum velocity of  $22.0 \text{ mm s}^{-1}$ .

Calculate the maximum displacement, in mm, of the wall of the baby's heart.  
Assume that the motion of the wall of the baby's heart is simple harmonic.

(4)

Maximum displacement of wall of heart = ..... mm

- (b) The motion of the wall of the baby's heart only approximates to simple harmonic.

State what is meant by simple harmonic motion.

(2)

(Total for Question 15 = 6 marks)