

- 6 The photograph shows an x-ray image of a person's knee. The person has had part of their knee replaced.



(Source: © edwardolive/Shutterstock)

- (a) X-rays are part of the electromagnetic spectrum.

All electromagnetic waves are transverse waves and transfer energy.

- (i) State another property that all electromagnetic waves have in common.

(1)

- (ii) State a harmful effect of excessive exposure to x-rays.

(1)

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(iii) Describe the difference between transverse waves and longitudinal waves.

You may draw a diagram to help your answer.

(3)

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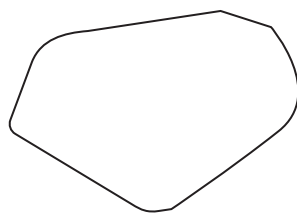
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- (b) The diagram shows a part of the knee called the patella. The patella has been removed from a person's knee.



The patella is a small, irregularly shaped bone that is denser than water.

Describe how to find the mass and the volume of the patella bone.

(4)

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(c) A scientist finds the volume and mass of a patella.

The mass of the patella is 17 g.

The volume of the patella is 13 cm<sup>3</sup>.

Calculate the density of the patella.

Give your answer to 2 significant figures.

(4)

density = ..... g/cm<sup>3</sup>

**(Total for Question 6 = 13 marks)**

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