

**Question 1 (3 Marks)**

Jack and Sadia work for a company that sells boxes of breakfast cereal.

The company wants to have a special offer.

Here is Jack's idea for the special offer.

Put 25% more cereal into each box and do **not** change the price.

Here is Sadia's idea.

Reduce the price and do **not** change the amount of cereal in each box.

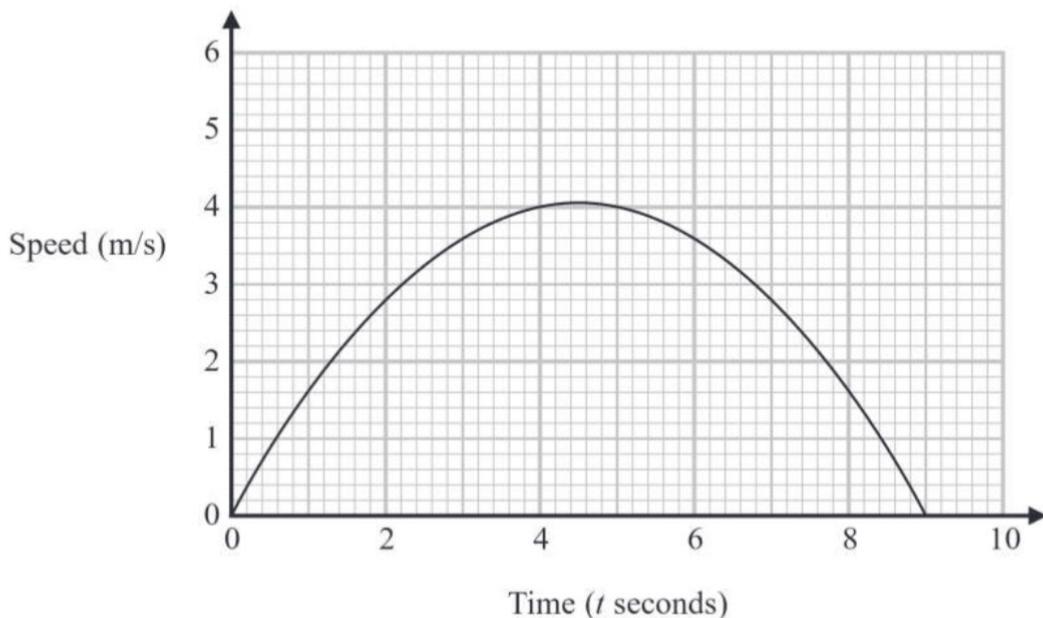
Sadia wants her idea to give the same value for money as Jack's idea.

By what percentage does she need to reduce the price?

.....%

**Question 2 (4 Marks)**

Here is a speed-time graph.



(a) Work out an estimate of the gradient of the graph at  $t = 2$

(3)

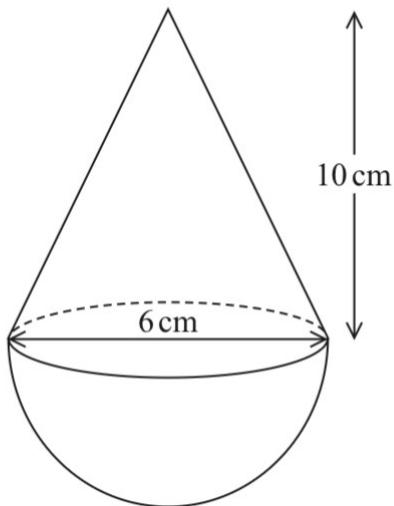
(b) What does the area under the graph represent?

(1)

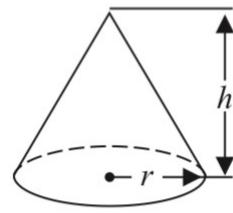
**Question 3 (4 Marks)**

The diagram shows a solid shape.

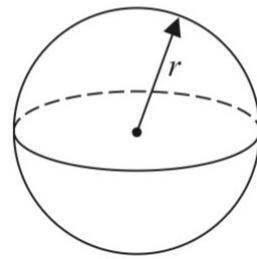
The shape is a cone on top of a hemisphere.



$$\text{Volume of a cone} = \frac{1}{3} \pi r^2 h$$



$$\text{Volume of a sphere} = \frac{4}{3} \pi r^3$$



The height of the cone is 10 cm.

The base of the cone has a diameter of 6 cm.

The hemisphere has a diameter of 6 cm.

The total volume of the shape is  $k\pi \text{ cm}^3$ , where  $k$  is an integer.

Work out the value of  $k$ .

$$k = \dots$$

**Question 4 (4 Marks)**

Make  $f$  the subject of the formula  $d = \frac{3(1-f)}{f-4}$

.....  
**(Total 15 Marks)**