5. The volume of a sphere is  $V = \sqrt{\frac{S^3}{36\pi}}$ , where S is its surface area.

The surface area of a sphere is 500 cm<sup>2</sup>.

(a) Calculate the volume of the sphere. Give your answer correct to **two decimal places**.

[3 marks]

(b) Write down your answer to (a) correct to the nearest integer.

[1 mark]

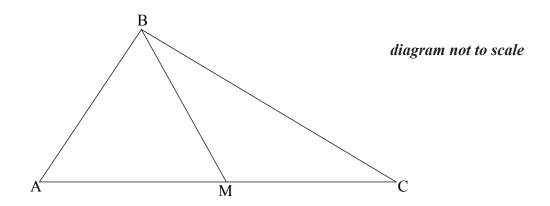
(c) Write down your answer to (b) in the form  $a \times 10^n$ , where  $1 \le a < 10$  and  $n \in \mathbb{Z}$ .

[2 marks]

Working:	
	Answers:
	(a)
	(b)
	(c)



7. The diagram shows a triangle ABC in which AC = 17 cm. M is the midpoint of AC. Triangle ABM is equilateral.



- (a) Write down
  - (i) the length of BM in cm;
  - (ii) the size of angle BMC;
  - (iii) the size of angle MCB.

[3 marks]

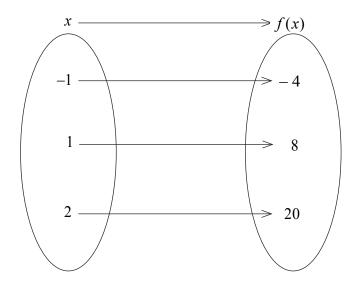
(b) Calculate the length of BC in cm.

[3 marks]

Working:	
	Answers:
	(a) (i)
	(ii)
	(iii)
	(b)



14. A quadratic function,  $f(x) = ax^2 + bx$ , is represented by the mapping diagram below.



- (a) Use the mapping diagram to write down **two** equations in terms of a and b. [2 marks]
- (b) Find the value of
  - (i) *a*;
  - (ii) b. [2 marks]
- (c) Calculate the x-coordinate of the vertex of the graph of f(x). [2 marks]

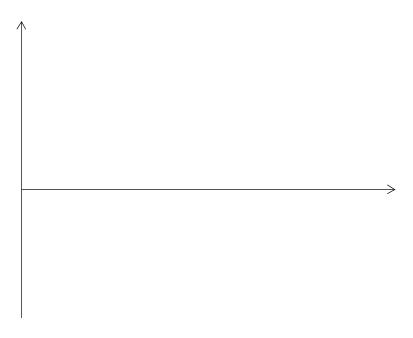
| Answers:
| (a) \_\_\_\_\_\_\_
| (b) (i) \_\_\_\_\_\_\_
| (ii) \_\_\_\_\_\_\_
| (c) |



- The function  $f(x) = 5 3(2^{-x})$  is defined for  $x \ge 0$ .
  - On the axes below sketch the graph of f(x) and show the behaviour of the (a) (i) curve as x increases.

Write down the coordinates of any intercepts with the axes. (ii)

[4 marks]



Draw the line y = 5 on your sketch. (b)

[1 mark]

Write down the number of solutions to the equation f(x) = 5. (c)

[1 mark]

Working:

Answers:

- (ii) (a)

