

SAMPLE PAPER 5: PAPER 1

QUESTION 9 (50 MARKS)

Question 9 (a) (i)

$$y = \frac{1}{6}x(12-x)$$

$$y = 0 \Rightarrow \frac{1}{6}x(12-x) = 0$$

$$x(12-x) = 0$$

$$\therefore x = 0 \text{ m, } 12 \text{ m}$$

Question 9 (a) (ii)

$$|OA| = 12 - 0 = 12 \text{ m}$$

Question 9 (a) (iii)

$$y = \frac{1}{6}x(12-x)$$

$$= 2x - \frac{1}{6}x^2$$

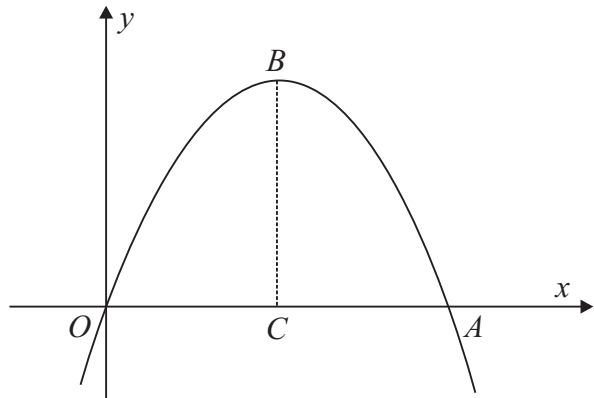
$$\frac{dy}{dx} = 2 - \frac{1}{3}x$$

$$\frac{dy}{dx} = 0 \Rightarrow 2 - \frac{1}{3}x = 0$$

$$2 = \frac{1}{3}x$$

$$\therefore x = 6 \text{ m}$$

$$x = 6: y = \frac{1}{6}(6)(12-6) = 6 \text{ m}$$

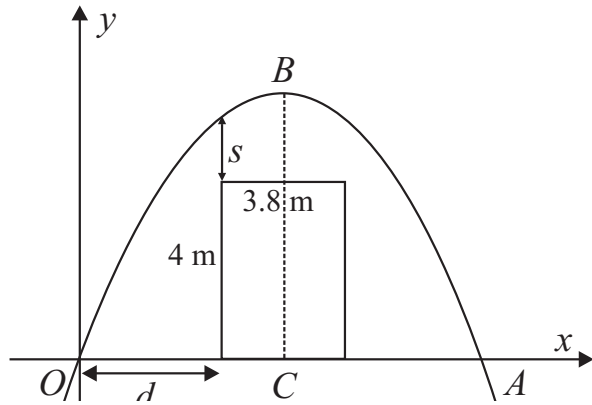


Question 9 (b) (i)

$$d = 6 - 1.9 = 4.1 \text{ m}$$

$$x = 4.1: y = \frac{1}{6}(4.1)(12-4.1) = 5.4 \text{ m}$$

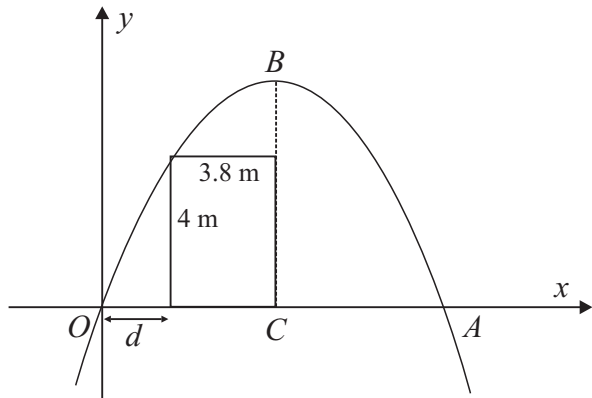
$$s = 5.4 - 4 = 1.4 \text{ m}$$



Question 9 (b) (ii)

$$d = 6 - 3.8 = 2.2 \text{ m}$$

$$x = 2.2: y = \frac{1}{6}(2.2)(12-2.2) = 3.6 \text{ m} < 4 \text{ m}$$



Question 9 (b) (iii)

$$y = 4: 4 = \frac{1}{6}x(12-x)$$

$$24 = 12x - x^2$$

$$x^2 - 12x + 24 = 0$$

$$x = \frac{12 \pm \sqrt{(-12)^2 - 4(1)(24)}}{2} = 2.54 \text{ m}$$