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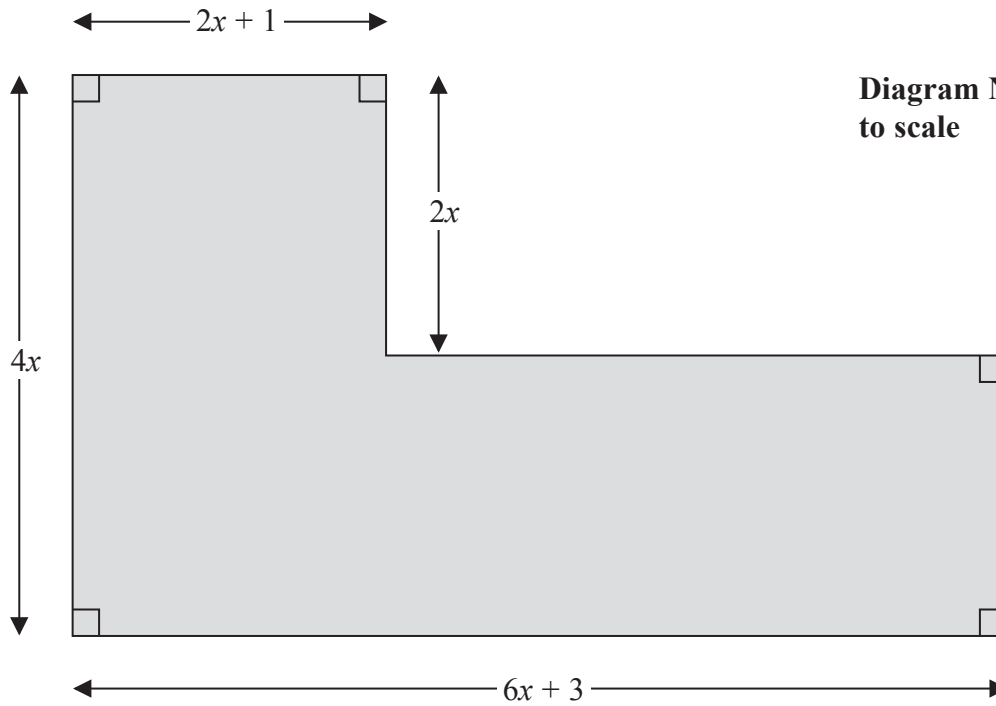


Diagram NOT to scale

Figure 1

Figure 1 shows the plan of a garden. The marked angles are right angles.

The six edges are straight lines.

The lengths shown in the diagram are given in metres.

Given that the perimeter of the garden is greater than 40 m,

(a) show that  $x > 1.7$  (3)

Given that the area of the garden is less than  $120 \text{ m}^2$ ,

(b) form and solve a quadratic inequality in  $x$ . (5)

(c) Hence state the range of the possible values of  $x$ . (1)

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7.

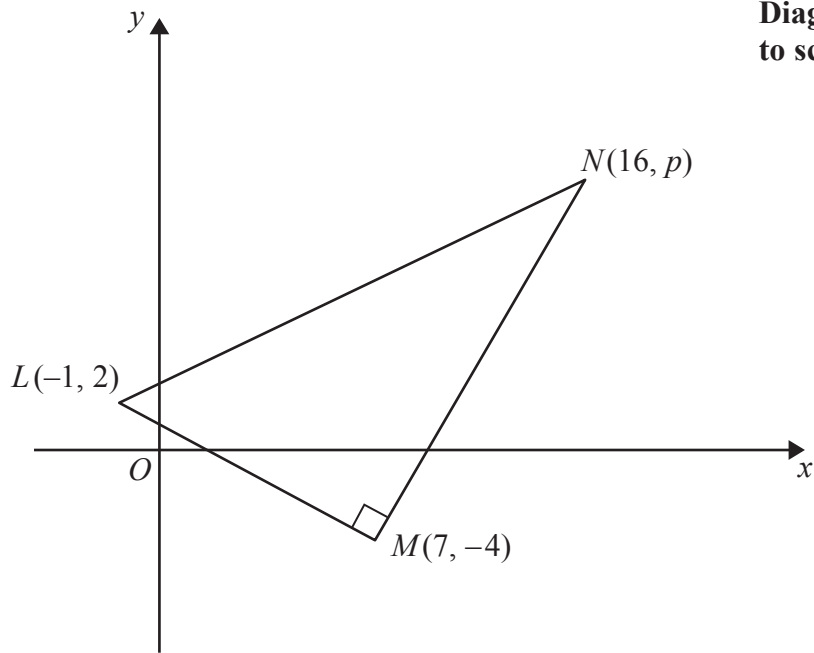


Diagram NOT to scale

Figure 2

Figure 2 shows a right angled triangle  $LMN$ .

The points  $L$  and  $M$  have coordinates  $(-1, 2)$  and  $(7, -4)$  respectively.

(a) Find an equation for the straight line passing through the points  $L$  and  $M$ .

Give your answer in the form  $ax + by + c = 0$ , where  $a$ ,  $b$  and  $c$  are integers.

(4)

Given that the coordinates of point  $N$  are  $(16, p)$ , where  $p$  is a constant, and angle  $LMN = 90^\circ$ ,

(b) find the value of  $p$ .

(3)

Given that there is a point  $K$  such that the points  $L$ ,  $M$ ,  $N$ , and  $K$  form a rectangle,

(c) find the  $y$  coordinate of  $K$ .

(2)

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9. The curve  $C$  has equation  $y = \frac{1}{3}x^2 + 8$

The line  $L$  has equation  $y = 3x + k$ , where  $k$  is a positive constant.

(a) Sketch  $C$  and  $L$  on separate diagrams, showing the coordinates of the points at which  $C$  and  $L$  cut the axes.

(4)

Given that line  $L$  is a tangent to  $C$ ,

(b) find the value of  $k$ .

(5)



























