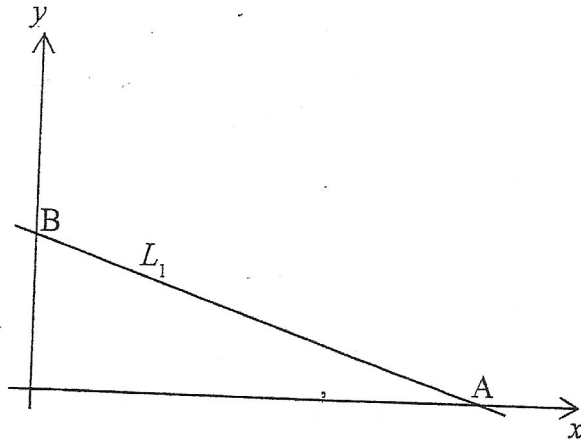


# IB Lines I

3. The diagram shows the straight line  $L_1$ , which intersects the  $x$ -axis at  $A(6, 0)$  and the  $y$ -axis at  $B(0, 2)$ .



- (a) Write down the coordinates of  $M$ , the midpoint of line segment  $AB$ .
- (b) Calculate the gradient of  $L_1$ .

The line  $L_2$  is parallel to  $L_1$  and passes through the point  $(3, 2)$ .

- (c) Find the equation of  $L_2$ . Give your answer in the form  $y = mx + c$ .

11. The equation of line  $L_1$  is  $y = -\frac{2}{3}x - 2$ .

(a) Write down the gradient of  $L_1$ .

[1]

Point P lies on  $L_1$  and has  $x$ -coordinate  $-6$ .

(b) Find the  $y$ -coordinate of P.

[2]

The line  $L_2$  is perpendicular to  $L_1$  and intersects  $L_1$  when  $x = -6$ .

(c) Determine the equation of  $L_2$ . Give your answer in the form  $ax + by + d = 0$ , where  $a$ ,  $b$  and  $d$  are integers.

[3]

**Working:**

**Answers:**

- (a) .....
- (b) .....
- (c) .....

# IB lines 3

12. An iron bar is heated. Its length,  $L$ , in millimetres can be modelled by a linear function,  $L = mT + c$ , where  $T$  is the temperature measured in degrees Celsius ( $^{\circ}\text{C}$ ).

At  $150^{\circ}\text{C}$  the length of the iron bar is 180 mm.

- (a) Write down an equation that shows this information.

At  $210^{\circ}\text{C}$  the length of the iron bar is 181.5 mm.

- (b) Write down an equation that shows this second piece of information.

- (c) Hence, find the length of the iron bar at  $40^{\circ}\text{C}$ .