

## SL / Linear functions [17 marks]

1. [Maximum mark: 5] 23M.1.SL.TZ1.1

Point  $P$  has coordinates  $(-3, 2)$ , and point  $Q$  has coordinates  $(15, -8)$ .  
Point  $M$  is the midpoint of  $[PQ]$ .

- (a) Find the coordinates of  $M$ . [2]

Line  $L$  is perpendicular to  $[PQ]$  and passes through  $M$ .

- (b) Find the gradient of  $L$ . [2]

- (c) Hence, write down the equation of  $L$ . [1]

2. [Maximum mark: 7] 22N.1.SL.TZ0.1

Let  $f(x) = -2x + 3$ , for  $x \in \mathbb{R}$ .

- (a) The graph of a linear function  $g$  is parallel to the graph of  $f$  and passes through the origin. Find an expression for  $g(x)$ . [2]

- (b) The graph of a linear function  $h$  is perpendicular to the graph of  $f$  and passes through the point  $(-1, 2)$ . Find an expression for  $h(x)$ . [3]

- (c) Find  $(g \circ h)(0)$ . [2]

3. [Maximum mark: 5] 22M.1.SL.TZ1.1

Consider the points  $A(-2, 20)$ ,  $B(4, 6)$  and  $C(-14, 12)$ . The line  $L$  passes through the point  $A$  and is perpendicular to  $[BC]$ .

- (a) Find the equation of  $L$ . [3]

(b) The line  $L$  passes through the point  $(k, 2)$ .

Find the value of  $k$ .

[2]