

Linear functions

[Solutions](#)[Main Menu](#)66 What is the midpoint of $(-3, 5)$ and $(2, -3)$?

- (A) $(-\frac{1}{2}, 1)$
 (B) $(\frac{1}{2}, -1)$
 (C) $(0, 1)$
 (D) $(2\frac{1}{2}, 4)$

67 What is the gradient of the line joining $(-4, 1)$ and $(4, 7)$?

- (A) -1
 (B) $-\frac{3}{4}$
 (C) $\frac{3}{4}$
 (D) 1

68 What is the gradient of the line perpendicular to the line $2x + y - 2 = 0$?

- (A) -2
 (B) $-\frac{1}{2}$
 (C) $\frac{1}{2}$
 (D) 2

69 What is the equation of the line through the points $(8, 0)$ and $(0, 6)$?

- (A) $4x + 3y + 24 = 0$
 (B) $3x + 4y + 24 = 0$
 (C) $4x + 3y - 24 = 0$
 (D) $3x + 4y - 24 = 0$

70 The line $6x - ky = 2$ passes through the point $(3, 2)$. What is the value of k ?

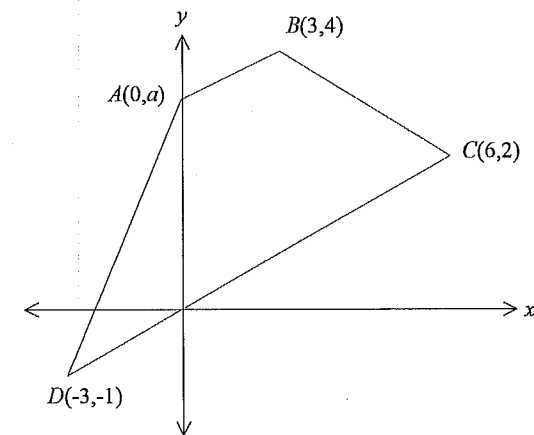
- (A) $\frac{10}{3}$
 (B) $-\frac{10}{3}$
 (C) -8
 (D) 8

71 What is the value of $\frac{a}{b}$ if the lines $ax + 2y = 6$ and $4y = bx - 9$ are parallel?

- (A) $\frac{1}{2}$
 (B) $-\frac{1}{2}$
 (C) -2
 (D) 2

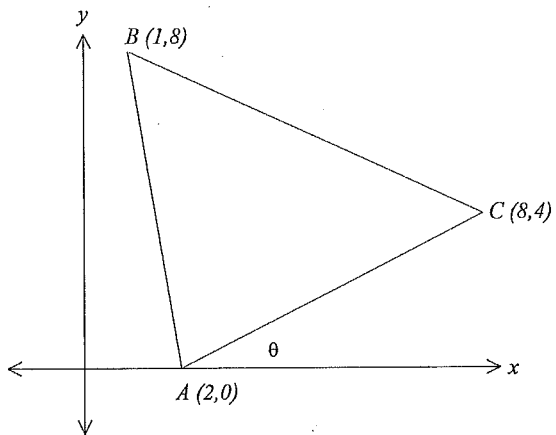
72 Let $A(-5, 9)$, $B(-3, y)$ and $C(2, -5)$ be three points on a number plane. What is the value of y if BC is perpendicular to AC ?

- (A) -2.5
 (B) -4.5
 (C) -7.5
 (D) -9.5

73 The points A, B, C and D have coordinates $(0, a)$, $(3, 4)$, $(6, 2)$ and $(-3, -1)$ respectively.What is the value of a if AB is parallel to DC ?

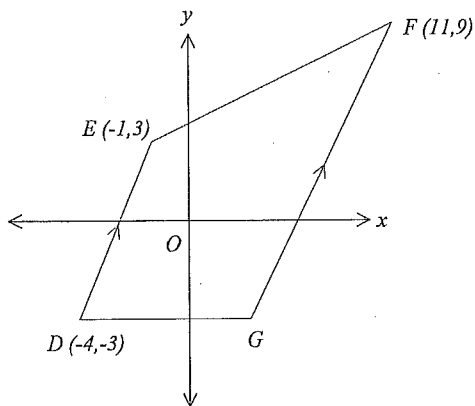
- (A) $a = 2.5$
 (B) $a = 3$
 (C) $a = 3.5$
 (D) $a = 5$

- 74 The points A , B and C have coordinates $(2,0)$, $(1,8)$ and $(8,4)$ respectively. The angle between the line AC and the x -axis is θ .



What is the equation of the line AC ?

- (A) $2x - 3y - 4 = 0$ (B) $3x - 2y - 4 = 0$
 (C) $2x - 3y + 6 = 0$ (D) $3x - 2y - 6 = 0$
- 75 On a number plane the points D , E and F have coordinates $(-4,-3)$, $(-1,3)$ and $(11,9)$ respectively. DE is parallel to GF and DG is parallel to the x axis.



What is the equation of the line FG ?

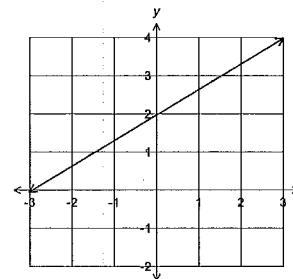
- (A) $2x - y - 7 = 0$ (B) $2x - y - 13 = 0$
 (C) $x - 2y + 13 = 0$ (D) $x - 2y + 7 = 0$

- 76 What is the equation of the line parallel to the y -axis that passes through the point $(1,2)$?

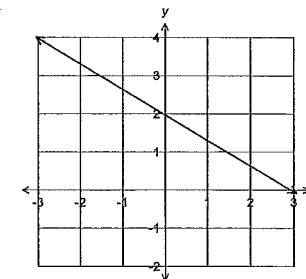
- (A) $x = 1$ (B) $x = 2$
 (C) $y = 1$ (D) $y = 2$

- 77 Which of the following could be the graph of $y = \frac{2}{3}x - 2$?

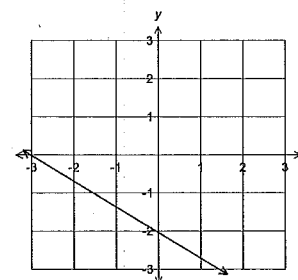
(A)



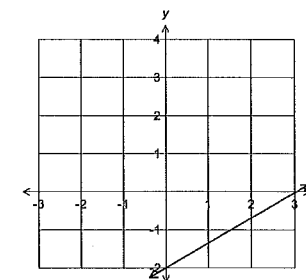
(B)



(C)



(D)



- 78 What is the point of intersection of the lines $y = x + 2$ and $y = -x + 4$?

- (A) $(1, 2)$
 (B) $(2, 1)$
 (C) $(1, 3)$
 (D) $(3, 2)$

Linear functions		Main Menu
	Solution	Criteria
66	Midpoint = $(\frac{-3+2}{2}, \frac{5+-3}{2}) = (-\frac{1}{2}, 1)$	1 Mark: A
67	$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7-1}{4--4} = \frac{6}{8} = \frac{3}{4}$	1 Mark: C
68	$2x + y - 2 = 0$ Gradient is -2 $y = -2x + 2$ Perpendicular to the line then $m_1 m_2 = -1$ $-2 \times m = -1$ or $m = \frac{1}{2}$	1 Mark: C
69	Gradient of line $M = \frac{y_2 - y_1}{x_2 - x_1} = \frac{6-0}{0-8} = -\frac{6}{8} = -\frac{3}{4}$ $y - y_1 = m(x - x_1)$ $y - 0 = -\frac{3}{4}(x - 8)$ $4y = -3(x - 8)$ $3x + 4y - 24 = 0$	1 Mark: D
70	$(3, 2)$ satisfies the equation $6x - ky = 2$ $6 \times 3 - k \times 2 = 2$ $18 - 2k = 2$ $-2k = -16$ or $k = 8$	1 Mark: D
71	$ax + 2y = 6$ $4y = bx - 9$ $2y = -ax + 6$ $y = \frac{b}{4}x - \frac{9}{4}$ $y = -\frac{a}{2}x + 3$ Parallel lines $m_1 = m_2$ $-\frac{a}{2} = \frac{b}{4}$ or $\frac{a}{b} = -\frac{1}{2}$	1 Mark: B
72	Gradient of BC $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{y - (-5)}{-3 - 2} = \frac{y + 5}{-5}$ Gradient of AC $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9 - (-5)}{-5 - 2} = \frac{14}{-7} = -2$ Perpendicular lines $m_1 m_2 = -1$ $\frac{y + 5}{-5} \times -2 = -1$ $2y + 10 = -5$ $2y = -15$ or $y = -7.5$	1 Mark: C

73	Gradient of AB $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - a}{3 - 0} = \frac{4 - a}{3}$ Gradient of AC $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - (-1)}{6 - (-3)} = \frac{3}{9} = \frac{1}{3}$ Parallel lines $m_1 = m_2$ $\frac{4 - a}{3} = \frac{1}{3}$ $4 - a = 1$ $a = 3$	1 Mark: B
74	Gradient of AC $M = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 0}{8 - 2} = \frac{4}{6} = \frac{2}{3}$ $y - y_1 = m(x - x_1)$ $y - 0 = \frac{2}{3}(x - 2)$ $3y = 2(x - 2)$ $2x - 3y - 4 = 0$	1 Mark: A
75	Line FG has the same gradient as DE (parallel lines) $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-3)}{-1 - (-4)} = \frac{6}{3} = 2$ $y - y_1 = m(x - x_1)$ $y - 9 = 2(x - 11)$ $y - 9 = 2x - 22$ $2x - y - 13 = 0$	1 Mark: B
76	$x = 1$ (vertical line through (1,2))	1 Mark: A
77	Gradient is $\frac{2}{3}$ and y-intercept is -2	1 Mark: D
78	Point of intersection has the same y value. $x + 2 = -x + 4$ $y = x + 2$ $2x = 2$ $y = 1 + 2$ $x = 1$ $= 3$ Point of intersection is (1, 3)	1 Mark: C