	Parallel and Perpendicular Lines Mark Scheme	
1(a)	Parallel lines have the same gradient $(m\ value\ in\ y = mx + c)$	[1]
1(b)	Perpendicular lines meet at 90° $(their\ gradients\ multiply\ to\ give\ -1)$	[1]
2(a)	$y - 5x = 2$	[1]
2(b)	$2y = 6x + 10$	[1]
3(a)	$y = -3x + 2$	[1]
3(b)	$y = 4x - 3$	[1]
3(c)	$y = 2x - 7$	[1]
4(a)	No	[1]
4(b)	No	[1]
4(c)	Yes	[1]
4(d)	Yes	[1]
4(e)	No	[1]
5(a)	$m = \frac{change\ in\ y}{change\ in\ x} = \frac{7-1}{10 - -2} = \frac{6}{12} = \frac{1}{2}$	[1] Calculating gradient
	$7 = \frac{1}{2} \times 10 + c$; $7 = 5 + c$; $c = 2$ $1 = \frac{1}{2} \times (-2) + c.$; $1 = -1 + c$; $c = 2$ $y = \frac{1}{2}x + 2$	[1] Substituting values for x and y to find the equation
5(b)	Perpendicular	[1]
5(c)	Parallel	[1]
5(d)	Parallel	[1]
5(e)	Neither	[1]
5(f)	Neither	[1]
5(g)	Perpendicular	[1]

Turn over ►

6	Parallel lines have the same gradient, so Gradient of D = Gradient of C	[1] Parallel lines define by equal gradient
	$Gradient\ of\ C = \frac{change\ in\ y}{change\ in\ x} = \frac{4 - -2}{11 - 2} = \frac{6}{9} = \frac{2}{3}$	[1] Calculation
	$Gradient\ of\ D = \frac{2}{3}$	[1] Correct gradient
	$Points\ on\ D = (3 + n\quad, 2 + \frac{2}{3}n)$ Point on D (6,4)	[1] accept any correct point on D
7(a)	$Gradient = \frac{3}{2}$	[1] Correct gradient
	$y = \frac{3}{2}x - 1$	[1] Correct equation of the line
7(b)	$Gradient\ = -\frac{2}{3}$	[1] Correct gradient
	$y = -\frac{2}{3}x + 1$	[1] Correct equation of the line
8(a)	$Gradient\ of\ A = \frac{change\ in\ y}{change\ in\ x} = \frac{1}{2}$	[1] Correct gradient
	$y = \frac{1}{2}x$	[1] Correct equation of the line
	$Gradient\ of\ B = \frac{change\ in\ y}{change\ in\ x} = -2$	[1] Correct gradient
	$y = \ -2x + 5$	[1] Correct equation of the line
8(b)	The product of gradients for perpendicular lines is -1	[1] Definition of perpendicular gradient
9(a)	$Parallel\ so\ m = 1/3$	[1] for correctly determining the gradient
	$Substituting\ vales\ for\ x\ and\ y$ $14 = \frac{1}{3} \times 9 + c\ ;\ c = 11.\ ;\ y = \frac{1}{3}x + 11$	[1] for calculating c
9(b)	$Perpendicular\ so\ m\ \times -3 = -1\ ;\ m = \frac{-1}{-3}\ ;\ m = \frac{1}{3}$	[1] for correctly determining the gradient
	$Substituting\ vales\ for\ x\ and\ y$ $4 = \frac{1}{3} \times 5 + c.;\ c = \frac{7}{3}.\ ;\quad y = \frac{1}{3}x + \frac{7}{3}$	[1] for calculating c
9(c)	$Perpendicular\ so\ m \times \frac{1}{3} = -1.\ ;\ m = -1 \times 3$ $m = -3$	[1] for correctly determining the gradient
	$Substituting\ vales\ for\ x\ and\ y$ $-5 = -3 \times -1 + c\ ;\ c = -8\ ;\ y = -3x - 8$	[1] for calculating c

9(d)	$2y = 3(2-3x)$; $2y = 7 - 9x$; $y = -\frac{9}{2}x + \frac{7}{2}$ Line is parallel, so $m = -\frac{9}{2}$	[1] for correctly determining the gradient
	$y = x + 8$ and $y = -3x + 4$ $x + 8 = -3x + 4$; $4x + 8 = 4$; $4x = -4$; $x = -1$ $y = -1 + 8$; $y = 7$ $Passes\ through\ the\ point\ (-1,7)$	[1] for finding the intersection point
	$y = -\frac{9}{2}x + c$; $7 = -\frac{9}{2} \times -1 = c$; $c = \frac{5}{2}$ $y = -\frac{9}{2}x + \frac{5}{2}$	[1] for calculating c
10	Opposite side of rectangle has the same gradient $y = \frac{2}{3}x + c$	[1] Value of c could be anything except 3.
	Other sides of rectangle must meet these two sides at 90°, so are perpendicular and have gradients such that they multiply with the original sides to make -1. $\frac{2}{3} \times -\frac{3}{2} = -1$; $m = -\frac{3}{2}$	[1] Gradient of other two sides
	$Equation\ of\ lines\ must\ be$: $y = -\frac{3}{2}x + c$	[1] Where the two intercepts (c's) aren't equal.
11(a)	$Line\ A$: $5y - 2x - 2 = 0$; $5y = 2x + 2$; $y = \frac{2}{5}x + \frac{2}{5}$ Line B is perpendicular, so the gradient is: $m \times \frac{2}{5} = -1$; $m = -\frac{5}{2}$ Equation of Line B $y = -\frac{5}{2}x + c$; $-1 = -\frac{5}{2} \times 1 + c$; $c = \frac{3}{2}$ $y = -\frac{5}{2}x + \frac{3}{2}$	[1] Find line B
	$y = \frac{2}{5}x + \frac{2}{5}$, $y = -\frac{5}{2}x + \frac{3}{2}$; $\frac{29}{10}x = \frac{11}{10}$. ; $29x = 11$, $x = \frac{11}{29}$ Substituting this value back in to find y $y = -\frac{5}{2}x + \frac{3}{2}$; $y = -\frac{5}{2} \times \frac{11}{29} + \frac{3}{2}$; $y = -\frac{55}{58} + \frac{3}{2}$ $y = \frac{16}{29}$ $Point\ of\ intersection\ is$ $(\frac{11}{29}, \frac{16}{29})$	[1] Find the point of intersection by solving as simultaneous equations
11(b)	A third line, C, is perpendicular to B and has y-intercept of -3. Write down the equation of C. Has the same gradient as A , $m = \frac{2}{5}$ Has a y-intercept of -3. , $c = -3$ $y = \frac{2}{5}x - 3$	[1] Equation of line C

END