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)	$m = \frac{\text{change in } y}{\text{change in } x} = \frac{7-1}{10--2} = \frac{6}{12} = \frac{1}{2}$	[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]

6	Parallel lines have the same gradient, so Gradient of D = Gradient of C	[1] Parallel lines define by equal gradient
	Gradient of $C = \frac{\text{change in } y}{\text{change in } x} = \frac{4 - -2}{11 - 2} = \frac{6}{9} = \frac{2}{3}$	[1] Calculation
	Gradient of $D = \frac{2}{3}$	[1] Correct gradient
	Points on $D = (3 + n \quad , 2 + \frac{2}{3}\, n)$ e.g. Point on D $(6,4)$	[1] accept any correct point on D
7(a)	Gradient $= \frac{3}{2}$	[1] Correct gradient
	e.g. $y = \frac{3}{2}x\ - 1$	[1] Correct equation of the line
7(b)	Gradient $= -\frac{2}{3}$	[1] Correct gradient
	e.g. $y = -\frac{2}{3}x + 1$	[1] Correct equation of the line
8(a)	Gradient of $A = \frac{\text{change in } y}{\text{change in } x} = \frac{1}{2}$	[1] Correct gradient
	$y = \frac{1}{2}x$	[1] Correct equation of the line
8(b)	Gradient of $B = \frac{\text{change in } y}{\text{change in } x} = -2$	[1] Correct gradient
	$y = \ -2x + 5$	[1] Correct equation of the line
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 values for x and y $4 = \frac{1}{3} \times 5 + c.$; $c = \frac{7}{3}.$; $y = \frac{1}{3}\, x + \frac{7}{3}$	[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)	$2y = 3(2-3x)$; $2y = 6-9x$; $y = -\frac{9}{2}x + \frac{6}{2}$ 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 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 $\left(\frac{11}{29}, \frac{16}{29}\right)$	[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