Oxford Revise | AQA GCSE Maths Higher | Answers

Chapter 6 Linear graphs

Question	Answer	Extra information	Marks
6.1	L_1 gradient = $\frac{2-(-3)}{4-(-1)}=\frac{5}{5}=1$ L_1 equation: $y=x-2$ L_2 equation: $y+7=4(x+2)\Rightarrow y=4x+1$ Equate the two: $x-2=4x+1$ $-3x=3$ $x=-1$ Coordinates of T are (–1, –3)	Find equation for L_1 using the two points Find equation for L_2 using point and gradient Set the two line equations equal to each other Solve for x, and then substitute to find y-coordinate	1 1 1 1

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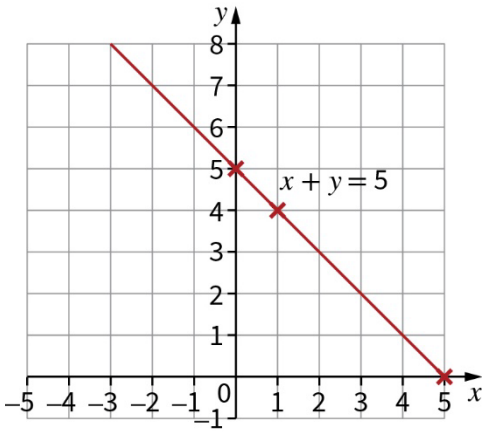
6.2		One correct point drawn Two correct points drawn Line passing through any two correct points	1 1 1

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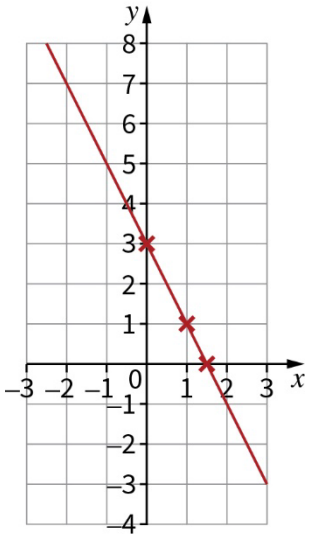
6.3		One correct point drawn Two correct points drawn Line passing through any two correct points	1 1 1
6.4 (a)	gradient $= 5$, y-intercept $= 1$		1 1
6.4 (b)	gradient $= -2$, y-intercept $= 3$		1 1
6.4 (c)	gradient $= 0.5$, y-intercept $= 3$		1 1
6.4 (d)	gradient $= 1$, y-intercept $= 10$		1 1
6.5	Passing through $(0, 5)$ means the y-intercept is 5 Parallel to the given line means the gradient is 4 Thus, the line is $y = 4x + 5$		1

Question	Answer	Extra information	Marks
6.6	Midpoint = $\left(\frac{2+4}{2}, \frac{6+7}{2}\right) = (3, 6.5)$	Method correct, or either 3 or 6.5 Fully correct	1 1
6.7 (a)	Find the gradient first: $m = \frac{3-(-1)}{2-0} = 2$ Use the gradient and one of the points to find the equation: $y - 3 = 2(x - 2)$ $y = 2x - 1$		1 1 1
6.7 (b)	Find the gradient first: $m = \frac{1-5}{1-(-3)} = -1$ Use the gradient and one of the points to find the equation: $y - 1 = -1(x - 1)$ $y = 2 - x$		1 1 1
6.8	$y = \frac{1}{2}x + 2$ is perpendicular to $y = -2x + 1$ $2x = 6 - 3y$ is perpendicular to $2y = 3x - 4$ $x + 2y - 1 = 0$ is perpendicular to $y - 2x = 0$ $y + x = \frac{1}{2}$ is perpendicular to $y = x - 2$	1 correct match 2 correct matches fully correct	1 1 1

Question	Answer	Extra information	Marks
6.9	$3x-6y+1=0$ $6y=3x+1$ $y=\frac{1}{2}x+\frac{1}{6}$ Gradient of any line perpendicular to this line will be -2 The equation will be $y=-2x+c$ The point $(4, -2)$ is on this line, so: $-2=-2\times4+c$ $c=6$ Equation of line: $y=-2x+6$	Rearranging first equation to find gradient Obtaining the gradient of a line perpendicular Finding the value of the y-intercept Correct answer	1 1 1 1
6.10	$2y+x=-1\Rightarrow y=-\frac{1}{2}x-\frac{1}{2}$ $\Rightarrow m=-\frac{1}{2}$ Gradient of perpendicular $=2$ Gradient of $AB=\frac{q-1}{p-2}=2$ Rearrange to get $q=2p-3$	Rearrange into form $y=mx+c$ Obtain perpendicular gradient Method to find gradient of AB Suitable equation formed involving p and q Correct answer, with q as the subject	1 1 1 1 1

Question	Answer	Extra information	Marks
6.11	B has coordinates (3, 0)	*B*(3, 0)	1
	$CO = \frac{1}{2}OB \Rightarrow C$ has coordinates $\left(-\frac{3}{2}, 0\right)$	$C\left(-\frac{3}{2}, 0\right)$	1
	Length of CB = $3 + \frac{3}{2} = \frac{9}{2}$ $CB = \frac{4}{3}BA$ Length of $BA = \frac{3}{4} \times \frac{9}{2} = \frac{27}{8}$	$A\left(3, -\frac{27}{8}\right)$	1
	Gradient of $AC = \frac{-\frac{27}{8} - 0}{3 - \left(-\frac{3}{2}\right)} = -\frac{3}{4}$	Method to find gradient of AC	1
	Using $y = mx + c$, with $m = -\frac{3}{4}$ and the point $\left(-\frac{3}{2}, 0\right)$ gives $c = -\frac{9}{8}$		
	The equation of *M* is $y = -\frac{3}{4}x - \frac{9}{8}$	Full method to find an equation of M	1

Question	Answer	Extra information	Marks
6.12	$3+\frac{2(x+1)}{5}-x=7-(2+x)$ $\frac{2(x+1)}{5}-x=4-(2+x)$ $\frac{2(x+1)}{5}-x=2-x$ $\frac{2(x+1)}{5}=2$ $2(x+1)=10$ $x+1=5$ $x=4$	There are many different ways to simplify and collect like terms, so give 1 mark for each correct operation that goes towards simplifying, to a maximum of 3	3
6.13	$\frac{a-\sqrt{bc}}{c^2-b}=\frac{10-\sqrt{(-18)(-2)}}{(-2)^2-(-18)}$ $=\frac{10-\sqrt{36}}{4+18}$ $=\frac{10-6}{22}$ $=\frac{4}{22}$ $=\frac{2}{11}$	Square root of $(-18)(-2)$ $c^2=4$ $\frac{4}{22}$ $\frac{2}{11}$	1 1 1 1