

# REVISE

.wales

## 3.07 – Linear graphs – $y = mx + c$ , parallel & perpendicular

*Mark schemes for the 3.07 question pack*

*Spec 2.4.1, 2.4.2, 2.4.3, 2.4.6 – Unit 2*

**SOLUTIONS · 2025 SPECIFICATION**

*Mark schemes for the 9 questions in the corresponding revise.wales question pack (27 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.*

Autumn 2016			
6.(a) (i)	2		B1 Accept 12/6 or equivalent. The correct gradient has to be unambiguously shown. $y = 2x + 4$ is B0. Allow e.g. $y = \textcircled{2}x + 4$ for B1.
6.(a) (ii)	$y = 2x + 4$		B2 F.T. 'their gradient' from (a) only if a whole number. B1 for $y = 2x \pm k$ . B1 for $y = kx + 4$ . B1 for $2x + 4$ ('y=' missing)
6.(b)	(Both have) equal gradients of 2.5.		B2 Accept equivalent of 2.5. Accept $y = 2.5x - 1.5$ AND $y = 2.5x + 1.75$ for B2 unless a contradiction is seen.  B1 for stating 'equal gradients' but not given as 2.5. B1 for sight of 2.5, or equivalent, but no mention of gradient. <u>Also</u> Correctly rewriting the equation(s) such that they show equal corresponding x and y coefficients, e.g. $2y = 5x - 3$ and $2y = 5x + 3.5$ gains a B1. In this case they need to make a further statement to show an understanding of gradients to gain 2 <sup>nd</sup> R1

e.g. 'power must be even', '25 is odd' etc.			Do not accept e.g. 'should be $2^{x-1}$ ', 'it isn't even'.
4.(a) $y = -x + 2$		B1	
4.(b) (2, 5)		B1	
4.(c) $\frac{2}{3}$		B1	

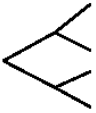
8.(c)	$(x - 7)(x + 4)$	ISW	B2	B1 for $(x \dots 7)(x \dots 4)$ .
9.(a)	$3y = 2x + 7$		B1	
9.(b)	$y = -\frac{x}{3} + 3$		B1	

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6.(a)	$\frac{1}{2}$	B1	
6.(b)	-3	B1	
6.(c)	(5, 2)	B1	

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8.	8	B1	Have included place value e.g. 2737 (...)
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<p>7.(a) Correct framework</p>  <p>Suitable labelling on both 1<sup>st</sup> pair of branches AND on both of at least one pair of 2<sup>nd</sup> set of branches. e.g. 'Car', 'No car', 'Before 8', 'After 8'. OR Titles of 'Car' and 'Before 8' with branch endings of 'Yes' and 'No'.</p> <p>Correct probabilities on first pair of branches 0·7 AND 0·3 (for 'Car', 'No car') OR 0·4 AND 0·6 (for 'Before 8', 'After 8')</p> <p>Correct probabilities on second two sets of branches 0·4 AND 0·6 correctly placed (following 0·7 and 0·3) OR 0·7 AND 0·3 correctly placed (following 0·4 and 0·6)</p>	<p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p>	<p>Accept any unambiguous wording.</p> <p>Must be consistent with their labelling. Allow this B1 if no headings given, <u>unless</u> contradicted by, or inconsistent with, further labelling.</p> <p>Allow this B1 if no headings given, <u>unless</u> contradicted by, or inconsistent with, further labelling.</p> <p>Allow this B1 if only shown on one set of branches. Provided not contradicted on the other set of branches.</p>
<p>7.(b) <math>0·7 \times 0·4</math> or equivalent. <math>= 0·28</math> or equivalent.</p>	<p>M1</p> <p>A1</p>	<p>No FT. M1A0 for a final answer of 0·28%. Mark final answer.</p>
<p>8.(a) <math>PA = 12(\text{cm})</math> AND correct theorem given, e.g. 'tangents from an external point are equal in length'.</p>	<p>E1</p>	<p>Must use the words '<u>tangents</u>' AND '<u>equal (identical/same)</u>'.  Do not accept e.g. '<math>PA = PB</math>'. (E0) Accept alternative correct answers.</p>
<p>8.(b) <math>\hat{PAO} = 90(^{\circ})</math> AND correct theorem given, e.g. 'the tangent at any point on a circle is perpendicular to the radius at that point'.</p>	<p>E1</p>	<p>Must use the words '<u>tangent</u>' AND '<u>radius (diameter)</u>'. Allow e.g. 'radius and tangent meet at 90'. (E1) Do not accept e.g. '<math>PA</math> and <math>OA</math> meet at 90'. (E0)</p>
<p>8.(c) (Area <math>PAOB =</math>) <math>2 \times \frac{12 \times 4}{2}</math> or equivalent.  <math>= 48 (\text{cm}^2)</math></p>	<p>M1</p> <p>A1</p>	<p>OR FT '<u>their <math>PA \times 4 + \frac{12 \times 4}{2}</math></u>' M0 for <math>48 \times 2</math> or <math>12 \times 4 \times 2 (= 96)</math></p> <p>An unsupported final answer of 48 gains both marks. If no marks gained allow SC1 for sight of <math>24(\text{cm}^2)</math> OR a correct evaluation of '<u>their <math>PA \times 4</math></u>' / 2.</p>
<p>9.(a) <math>y = 2·5x + 3</math></p>	<p>B1</p>	
<p>9.(b) <math>y = 3x - 5</math></p>	<p>B1</p>	
<p>9.(c) Line D</p>	<p>B1</p>	
<p>10.(a) <math>t \propto 1/g</math> OR <math>t = k/g</math> <math>36 = k/25</math> OR <math>k = 900</math>  <math>t = 900/g</math></p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Allow <math>t \propto k/g</math> FT from <math>y \propto 1/x^n</math> with <math>n \neq 1, n &gt; 0</math> No FT from direct proportion M1 implies B1. May be seen explicitly in part (b). Do not allow <math>t \propto 900/g</math> for the A mark</p>
<p>10.(b) <math>(900/20 =)</math> 45 (days)</p>	<p>B1</p>	<p>FT 'their formula' only if non-linear.</p>
<p>10.(c) Sight of 900/40  22 (goats)</p>	<p>M1</p> <p>A1</p>	<p>FT 'their formula' only if non-linear and of equivalent difficulty</p> <p>M1 A0 for an answer of 22·5 or 23 For A1, FT for equivalent difficulty i.e. need to round down an answer with a decimal part of 0.5 or over. Allow use of trial and improvement for M1, provided 22 or 23 seen. A0 for incorrect working e.g. <math>90/4</math> given as 22.2, leading to 22.</p>
<p>11. (a) <math>(\sqrt[3]{m})^2</math></p>	<p>B1</p>	
<p>11. (b) <math>p^{\frac{1}{2}}</math></p>	<p>B1</p>	

5.(a) (i)	4	B1	Accept 4/1 or equivalent. The correct gradient has to be unambiguously shown. $y = 4x - 2$ is B0, but $y - (4)x - 2$ is B1. Award B0 for a final answer of $4x$ .
5.(a) (ii)	$y = 4x - 2$	B2	FT 'their gradient' from (a) Award B1 for one of the following: <ul style="list-style-type: none"><li>• <math>y = 4x \pm k</math>.</li><li>• <math>y = kx - 2</math> (<math>k \neq 0</math>)</li><li>• <math>4x - 2</math> ('y =' missing)</li><li>• <math>y = 4x + - 2</math>.</li></ul>

5. (b) Valid explanation with rearranged equation AND indicating that the gradient is 3 or equivalent e.g. " $2y - 6x = 23$  is the same as  $y = 3x + 11.5$ , so the gradient of both lines is 3"  
" $2y = 6x + 23$  and  $2y = 6x - 16$  and the gradient of both lines is 3"

B2

B1 for one of the following:

- sight of  $y = 3x + k$  ( $k \neq 0$  or  $-8$ )
- sight of  $y = \frac{6x + 23}{2}$
- showing 2 equivalent equations written in the same format e.g.  $2y = 6x + 23$  and  $2y = 6x - 16$
- unsupported statement that both the gradients are 3.

Allow "the 3x (or 3) show the lines are parallel" as an explanation

Do not allow:

- "the gradients are the same" unless the '3' is also given or unambiguously shown
- gradient = 3x.

20. Horizontal translation to the left with curve intercepting $x$ axis at $(3, 0)$ and $(7, 0)$ .  $(5, -1)$	B2  B1	Mark clear intention. If not B2, award B1 for a horizontal translation to the left. CAO
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5.(a)	-3	B1	
5.(b)	(0, 7)	B1	