

Mark scheme

Question			Answer/Indicative content	Marks	Guidance	
1	a		$x^2 + 5x - 7x - 35$ [= $x^2 - 2x - 35$]	1		All four terms must be seen Could be seen in a grid
	b		-35 [y-intercept] -5 and 7 [roots]	1 1	Must be in correct place	Allow (0, -35) Allow (-5, 0) and (7, 0)
	c		(1, -36)	2	B1FT for 1 B1FT for -36	B1FT is mid-point of their two roots from 21(b) provided one is positive and one negative <i>Their</i> 1 must be > 0 B1FT for their value of x <i>Their</i> -36 must be < 0
			Total	5		
2			1, -2	1		
			Total	1		
3			Vertical line with 7 marked on x-axis	2	B1 for vertical line or line through the point (7,0)	Mark intent, minimum length of line 2cm by eye, condone dashed line
			Total	2		
4	a		Amari travels at a constant speed	1		

	b		50	1	
	c		25	2	M1 for <i>their</i> (b) ÷ 2
	d		Line or curve from (11 00, 50) to (12 15, 0) with no horizontal or vertical sections	2	B1 for line or curve reaching time axis after 11 00 or for 12 15 soi e.g. a line ending at time 12 15
			Total	6	
5	a		Correct curve through given points	3	B2 for 6 points correctly plotted or B1 for 4 points correctly plotted Half square accuracy. For curve: No line segments used Condone minor feathering or doubling Max half square vertically or horizontally from any point
	b		<i>their</i> -0.7 and <i>their</i> 2.7	2	Strict FT from <i>their</i> graph. B1 for each or ruled $y = 4$ cutting <i>their</i> curve twice or points indicated on <i>their</i> curve where $y = 4$ Must have graph to score Do not accept coordinates Half square accuracy or better For thick lines mark centre of line Ruled line within half square of $y = 4$ throughout <i>Their</i> curve may be a polygon or

					straight line If intersection at mid-point of small square e.g. -0.75 accept -0.8 or -0.7
			Total	5	
6	a	i	(4, -3)	1	
		ii	Plot at (-2, 3).	1	
	b		$x = 4$	1	
			Total	3	
7	a		$x^2 + 3x - 5x - 15$ [$= x^2 - 2x - 15$]	1	All four terms must be seen Could be seen in a grid <u>Examiner's Comments</u> Most candidates were not able to clearly show this expansion. The mark scheme expects candidates to show the correct 4 term expansion of the two brackets. Candidates often made errors by having incorrect signs for the coefficients. This question was also omitted by a significant proportion of candidates.
	b		-15 [y-intercept] -3 and 5 [roots]	1	Allow (0, -15) Must be in correct place. Allow (-3, 0) and (5, 0) <u>Examiner's Comments</u> A very small proportion of candidates gained marks in this question. Most candidates did not link this part to Question 21 (a) and so did not use the information there to help them here.

					Most candidates who did score gave the correct y-intercept of -15. Those who gave answers for the x-intercepts tended to give -5 and 3. This question was omitted by a significant proportion of candidates.
	c		(1, -16)	2	B1FT for 1 B1FT for -16 B1FT is mid-point of their two roots from 12(b) provided one is positive and one negative. <i>Their</i> 1 must be > 0 B1FT for their value of x <i>their</i> - 16 must be < 0 <u>Examiner's Comments</u> A very small proportion of candidates gained marks in this question. Where candidates scored one mark, it was for having the correct x-coordinate of 1. A small number of candidates did gain the follow through (FT) mark for their x-coordinate, however this was rare due to the large number of candidates who did not answer Question 21 (b). It was very rare to award a mark for the y-coordinate (either as -16 or from the FT). A very small number of high attaining candidates achieved the correct answer from using completing the square.
			Total	5	
8			$-2, 1$	1	<u>Examiner's Comments</u>

					This was almost always correct. A few candidates reversed the coordinates.
			Total	1	
9			Horizontal line with 4 marked on y-axis	2	B1 for horizontal line or line through the point (0,4) Mark intent, minimum length of line 2cm by eye, condone dashed line <u>Examiner's Comments</u> Few candidates scored full marks here, but there were a significant number who scored 1 mark for knowing a horizontal line was required. Several did not mark their y-axis intercept as 4. Some drew the line $x = 4$.
			Total	2	
10	a		Zayn travels at a constant speed	1	<u>Examiner's Comments</u> Few candidates provided the correct answer to what is a relatively common question relating to the interpretation of distance-time graphs. Many gave a fact such as arrival time or time spent at the shopping centre.
	b		50	1	<u>Examiner's Comments</u> Most candidates gave the correct answer of 50.
	c		25	2	M1 for <i>their</i> $(b) \div 2$ <u>Examiner's Comments</u>

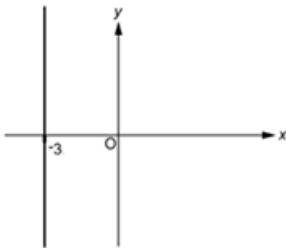
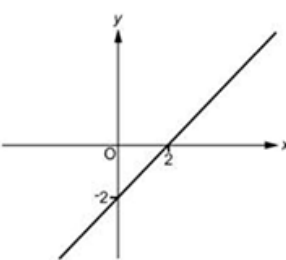
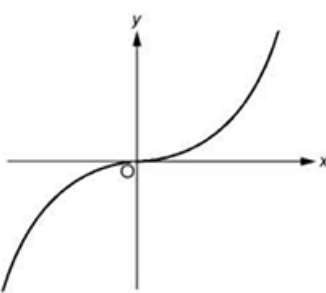
					Many candidates did not apply the formula for speed correctly. Some calculated 50×2 rather than dividing.
	d		Line or curve from (11 00, 50) to (12 45, 0) with no horizontal or vertical sections	2	B1 for line or curve reaching time axis after 11 00 or for 12 45 soi eg a line ending at time 12 45 <u>Examiner's Comments</u> Many candidates completed the graph correctly. Some did not correctly convert $1\frac{3}{4}$ hours to work out the time of arrival.
			Total	6	
11	a		2	1	Accept (0, 2) and $y = 2$ and +2
	b		$2 \times 40 + 2$ soi 82 or $(83 - 2) \div 2$ soi 40.5 oe Below	M1 A1	e.g. by (40, 82)
	c		$y = 2x + k, k \neq 2$	1	
			Total	4	
12			Correct graph	3	Curves must not be joined, nor touch either axis except at $x = -\frac{8}{3}$ B2 for 7 or 8 correct plots or B1 for 5 or 6 correct plots Mark curve first Condone slight feathering No ruled segments If no plot, curve implies plot Condone continuation of graph after (-1, -5) or before (1, 11) if graph continues to decrease/increase

						and does not touch y-axis
			Total	3		
13			$y = 2x + 4$ final answer	4	B3 for final answer $2x + 4$ OR B2 for gradient = 2 soi or M1 for $\frac{10-4}{3-0}$ oe B1 for c clearly identified as 4 soi	B2 implied by $[y =] 2x + c$ M1 could be a right-angled triangle on the diagram and $\frac{\text{difference in y}}{\text{their difference in x}}$ B1 implied by $[y =] mx + 4$ but not by a graph 'y-intercept = 4' scores B1
			Total	4		
14			F C	2	B1 for each	Accept correct equations
			Total	2		
15	a		Correct curve through given points	3	B2 for 6 points correctly plotted or B1 for 4 points correctly plotted	Half square accuracy. Use overlay as guide For curve: No line segments used Condone minor feathering or doubling Max half square vertically or horizontally from any point

					<u>Examiner's Comments</u> Many candidates plotted the points yet did not join them with a curve. A few tried to use straight lines. Many did not correctly plot the points within a half-square accuracy (particularly the point at (1, -1), possibly because of the proximity of the '1' label on the x-axis). Some points were plotted using very blunt pencils. The few curves that were seen were often not accurate and missed the plotted points by more than a half square vertically or horizontally. A surprising number of candidates made no attempt to plot the points and did not respond at all.  Assessment for learning Candidates need to practise accurately plotting points and how to then draw a curve through them.		
	b		<i>their</i> -1.1 and <i>their</i> 2.6	2	<table><tr><td> Strict FT from <i>their</i> graph. B1 for each or ruled $y = 6$ cutting <i>their</i> curve twice or points indicated on <i>their</i> curve where $y = 6$ </td><td> Must have graph to score Do not accept coordinates Half square accuracy or better For thick lines mark centre of line Ruled line within half square of $y = 6$ throughout <i>Their</i> curve may be a polygon or straight line If intersection </td></tr></table>	Strict FT from <i>their</i> graph. B1 for each or ruled $y = 6$ cutting <i>their</i> curve twice or points indicated on <i>their</i> curve where $y = 6$	Must have graph to score Do not accept coordinates Half square accuracy or better For thick lines mark centre of line Ruled line within half square of $y = 6$ throughout <i>Their</i> curve may be a polygon or straight line If intersection
Strict FT from <i>their</i> graph. B1 for each or ruled $y = 6$ cutting <i>their</i> curve twice or points indicated on <i>their</i> curve where $y = 6$	Must have graph to score Do not accept coordinates Half square accuracy or better For thick lines mark centre of line Ruled line within half square of $y = 6$ throughout <i>Their</i> curve may be a polygon or straight line If intersection						

					at mid-point of small square e.g. -1.15 accept -1.2 or -1.1 <u>Examiner's Comments</u> Many candidates could not score marks here as they had not drawn a graph in part (a). A few did draw the horizontal line $y = 6$ to earn B1, but a very few candidates drew $x = 2$ instead. Where lines did exist, reading was often inaccurate; readings were often taken to be at the nearest integer point (for example, if their graph crossed the line where the x-coordinate was -1.2, it would be given as -1). Some responses seemed to be the intercepts of their curve with the x-axis, while others gave responses that seemed unrelated to the graph they had drawn.
			Total	5	
16	a	i	$(-2, -3)$	1	<u>Examiner's Comments</u> Both parts (a) (i) and (ii) were answered correctly by the majority of candidates. Those candidates not given both marks had usually got the x- and y-coordinates in the wrong order. In (a) (ii), a few candidates plotted $(4, 1)$ instead of $(4, -1)$.
		ii	Plot at $(4, -1)$.	1	<u>Examiner's Comments</u> Both parts (a) (i) and (ii) were answered correctly by the majority of candidates. Those candidates not given both marks had usually got the

					x- and y-coordinates in the wrong order. In (a) (ii), a few candidates plotted (4, 1) instead of (4, -1).
	b		$x = -2$	1	Examiner's Comments Many candidates did not understand how to write the equation of a vertical line. Again, some confused x and y, giving 'y = 2'.
			Total	3	
17	a		0.1 or 0.09 to 0.10 cm per minute or cm/min	2 1	M1 for $\frac{1.8 \text{ to } 2}{20}$ oe If 0 scored, SC1 for triangle with incorrect values marked and $\frac{\text{rise}}{\text{run}}$ <i>their</i> $\frac{\text{rise}}{\text{run}}$ or $\frac{\text{rise}}{\text{run}}$ with answer in range $0.08 \leq g < 0.09$ e.g. $\frac{0.9 \text{ to } 1}{10}$ e.g. $\frac{8}{10}$ with no triangle scores 0 e.g. $\frac{8}{10}$ with 8 and 10 marked on triangle scores SC1 e.g. $\frac{1.0}{11.6}$ and answer 0.086... SC1 Mark for units still available even if wrong gradient
	b	i	$10 \times \text{their gradient}$ $12 + \text{their } 1$ giving answer that rounds to 13	M1 M1	FT <i>their gradient</i> which is a number <u>Alternative method</u> M2 for $30 \times (0.09 \text{ to } 0.1) + 10$ with answer that rounds to 13 or M1 for $30 \times \text{their gradient} + 10$ with answer that does not round to 14
		ii	Continues to rise at same rate oe or Rises 0.1 cm every minute oe	1	FT <i>their gradient</i> if figures quoted Must imply constant

						increase [in height] or continued pattern If figures used must be correct or from <i>their</i> gradient Accept The pattern continues oe The dough rises consistently oe The dough will rise 1 cm in 10 minutes
			Total	6		
18	a		Correct sketch with -3 indicated as x-intercept 	2	B1 for a vertical line to the left of the y-axis	Condone good freehand Line must be at least 10 mm
	b		Correct sketch with -2 indicated as y-intercept and 2 indicated as x-intercept 	3	B1 for line with positive gradient and B1 DEP for a line with -2 indicated as y-intercept or for a line with 2 indicated as x-intercept	Condone good freehand Line must be at least 10 mm
	c		Correct sketch 	1	Curve, correct shape	Condone intention to show turning point at (0,0) and length of curve.

			Total	6	
19	a		5 : 1 oe	1	Accept 1 : 0.2
	b		$\frac{4}{7}$	2	M1 for $\frac{8}{14}$ oe
			Total	3	
20	a		(0, 3)	1	
	b		Point plotted at (-4, 4)	1	Accept unlabelled if no others
			Total	2	
21	a		(3, 2) plotted correctly	1	Take centre of mark as position If A used as plot, scores 1 if centre of A in correct position
	b		5	1	
	c		Ruled horizontal line $y = -3$	1	Accept good freehand and dashed line If more than one horizontal line and no clear choice mark the worst, ignore line at $y = 2$ If $x = -3$ also drawn and not rejected, treat as choice
	d		(-2, 2)	2	B1 for answer (-2, -3) or (-2, 2) seen or plotted on grid If 0 scored, Ignore other points

					SC1 for answer (-2, ...) or (... , 2)	
			Total	5		
22	a		21	1		Do not accept coordinates Condone y = 21
	b		5	1		Do not accept coordinates Condone x = 5
			Total	2		
23	a		13 -3	2	B1 for each	
	b		Correct curve	3	B2FT for 7 or 8 points accurately plotted or B1FT for 5 or 6 points accurately plotted	Tolerance $\pm \frac{1}{2}$ small square radially
	c		-1.7 or -1.8 1.7 or 1.8	2 FT	Strict FT B1 for either FT their graph	If curve is between 2 grid lines accept either value as correct answer Do not accept answers to morethan 1d.p. Do not allow $\pm\sqrt{3}$ or answers with no graph
			Total	7		
24			$y = 3x - 21$ with correct working	5		

					M1 for attempt at $\frac{\text{change in } y}{\text{change in } x}$ A1 for 'm' = 3 M1 for $0 = \text{their 'm'} \times 7 + \text{'c'}$ or $-12 = \text{their 'm'} \times 3 + \text{'c'}$ or for $\frac{7}{4}$ $\times [\pm]12$ oe A1 for 'c' = -21 If 0 scored, SC1 for implying the y-intercept is -21 with no or insufficient working, may be seen on the diagram or for D is (3, -12)	'correct working' requires evidence of at least M1M1 or M1A1 may be implied on the diagram or may be implied by -3 M1A1 soi by ['m'] 3 Allow FT from D or <i>their</i> D stated may be implied on the diagram
			Total	5		
25	a		11 and 2	2	B1 for each	
	b		Correct curve	3	B2FT for 6 or 7 correct plots B1FT for 4 or 5 correct plots Tolerance ± 1 small square for plotting and curve through correct points Condone slight feathering – must not be ruled If large blob for plot, check centre of blob	
	c		-2.5 to -2.4 and 2.4 to 2.5	2FT	Strict FT B1 for either FT <i>their</i> graph Tolerance $\pm \frac{1}{2}$ a small square Do not allow	

					exact answers or answers with no graph Do not FT from a straight line graph If more than 2 intersections, B1 for each correct intersection on the answer line. If more than 2 answers, mark the worst
			Total	7	
26	a		(-4, 2)	1	
	b		H plotted at (1, -3)	1	Must be labelled if more than 1 point plotted
			Total	2	
27	a		Straight line oe Passes through origin oe	1 1	
	b		24	1	
	c		€195 < €216 or £162.5[0] < £180 with correct working	4	Allow exchange rates of 1.15 to 1.25 leading to €207 to €225 or £156 to £170 M2 for $195 \div 1.2$ or 180×1.2 A1 for [£]162.5[0] or [\$]216 Or M1 for a correct exchange rate e.g. $24 \div 20$ OR M2 for building up Comparison in symbols or words required Allow FT <i>their</i> value from (b) Allow correctly rounded values used for M marks e.g. for £8.33 or £8 for €10 used

					to € equivalent of £180 or £ equivalent of €195 e.g. 18×10 or 9×20 or 18×12 or 9×24 A1 for [£]162.5[0] or [€]216 Or M1 for building up to £180 or €195 e.g. 18×10 or 9×20 or 16.25×12 or $180 \div 10 = 18$ OR M2 for $195 \div 12$ and $180 \div 10$ A1 for 16.25 and 18 Or M1 for $195 \div 12 = 16.25$ or $180 \div 10 = 18$ If 0 scored SC1 for $\\$195 < (\text{€}207 \text{ to } \text{€}225)$ or $(\text{£}156 \text{ to } \text{£}170) < \text{£}180$ with no or insufficient working, but not wrong working	
	d		21 or FT <i>their</i> (c)	1 dep	Dep on A1 or SC1 awarded in part (c)	Accept 20.99
			Total	8		
28			E F D C	4	B1 for each	Accept correct equations
			Total	4		
29	a		5 cao	1		
	b	i	$y = 5x + 3$	1		Allow 'The second one'

					oe for $y = 5x + 3$
		ii	Comment: Rejecting 4 [as gradient] and/or indicating $5 > 3$	1	Response Mark The number before x is bigger in the second one <i>Compares the numbers for gradient 1</i> The 4 is not the gradient, it is the y intercept. The gradient is 3 <i>Okay, rejects gradient 1</i> Because it is only 3 whereas $y = 5x + 3$ is the steepest <i>BOD 3 for gradient and implied comparison with 5 1</i> The number added is the [y] intercept and not the gradient <i>Okay, rejects constant 1</i> It's actually the second steepest <i>True but no reason given 0</i> Because 3 isn't the highest number <i>Doesn't compare the gradients 3 and 5. There are lots of 'numbers' 0</i>
	c		$5 \times 30 - 3$ soi 147 or $(150 + 3) \div 5$ soi 30.6 oe Below	M1 A1	
			Total	5	
30	a	1		1	Accept (0, 1) and $y = 1$ and +1 <u>Examiner's Comments</u> Most candidates offered an answer and many were correct, however equations, coordinates that weren't (0, 1) and numbers other than 1 were common.
	b		$2 \times 40 + 1$ soi 81 or $(80 - 1) \div 2$ soi 39.5 oe Above	M1 A1	e.g. by (40, 81) <u>Examiner's Comments</u> Some candidates did not attempt this

					question and many who did lacked a clear strategy to respond to it. Some referred to a point on the grid that the line passed through and scaled this up, not recognising that the graph did not show direct proportion. Some referred to odd and even coordinates. Very few chose to substitute 40 into the equation of the line.		
	c		$y = 2x + k, k \neq 1$	1	<u>Examiner's Comments</u> Almost half of the candidates did not respond to this. Of those that did, very few had a coherent strategy. Common errors were $x = 2y + 1$, or to keep the constant as 1 and change the x-coefficient.		
			Total	4			
31			$y = 4x + 5$ final answer	4	<table><tr><td> B3 for final answer $4x + 5$ OR B2 for gradient = 4 so or M1 for $\frac{13-5}{2-0}$ oe B1 for c clearly identified as 5 so </td><td> B2 implied by $[y =] 4x + c$ M1 could be a right angled triangle on the diagram and <i>their</i> $\frac{\text{diff in } y}{\text{diff in } x}$ B1 implied by $[y =] mx + 5$ but not by a graph 'y-intercept = 5' scores B1 </td></tr></table>	B3 for final answer $4x + 5$ OR B2 for gradient = 4 so or M1 for $\frac{13-5}{2-0}$ oe B1 for c clearly identified as 5 so	B2 implied by $[y =] 4x + c$ M1 could be a right angled triangle on the diagram and <i>their</i> $\frac{\text{diff in } y}{\text{diff in } x}$ B1 implied by $[y =] mx + 5$ but not by a graph 'y-intercept = 5' scores B1
B3 for final answer $4x + 5$ OR B2 for gradient = 4 so or M1 for $\frac{13-5}{2-0}$ oe B1 for c clearly identified as 5 so	B2 implied by $[y =] 4x + c$ M1 could be a right angled triangle on the diagram and <i>their</i> $\frac{\text{diff in } y}{\text{diff in } x}$ B1 implied by $[y =] mx + 5$ but not by a graph 'y-intercept = 5' scores B1						

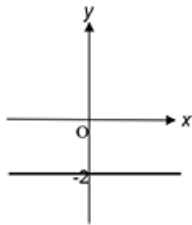
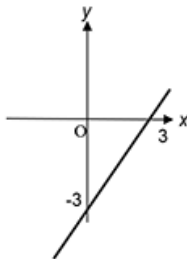
					<u>Examiner's Comments</u> There was a lack of knowledge demonstrated by candidates in this question and it was often omitted. Those who did attempt the question often added or subtracted the numbers given on the axis to try to find an answer. Where candidates scored, it was often a mark for identifying the y-intercept as 5.
			Total	4	
32			Correct graph	3	Curves must not be joined, nor touch either axis except at $x = -3$, B2 for 7 or 8 correct plots or B1 for 5 or 6 correct plots Use overlay as a guide accuracy $\pm \frac{1}{2}$ box radially Mark curve first Condone slight feathering No ruled segments If no plot, curve implies plot Condone continuation of graph after (-1, -4) or before (1, 8) if graph continues to decrease/increase and does not touch y-axis <u>Examiner's Comments</u> Of the candidates attempting the question, the vast majority were given B2 for plotting 7 or 8 plots within tolerance. Some candidates used large crosses or large blobs however, meaning the accuracy of their plotting was sometimes in doubt. Many did not demonstrate that they knew what a reciprocal graph should look like and joining the two correct sections of the graph together through the origin was common. Many

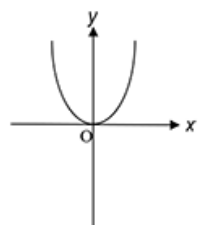
					candidates did not attempt this question.
			Total	3	
33			B F	2	B1 for each Accept correct equations <u>Examiner's Comments</u> Most correctly identified the first diagram as B, or in some cases as y = x. Few candidates correctly identified the second diagram.
			Total	2	
34	a		(-3, 3) plotted correctly	1	Use overlay if in doubt Take centre of mark as position If A used as plot, scores 1 if centre of A in correct position <u>Examiner's Comments</u> Most candidates plotted their point accurately at (-3, 3), although many did not label it A. A significant number of candidates used 'A' only to mark the plot rather a cross, which is to be discouraged as it is inaccurate. Some candidates plotted at (3, -3) and a few at other points.
	b		5	1	<u>Examiner's Comments</u> Most candidates answered this question correctly. A significant number of answers of 6 cm were seen, suggesting candidates were

					counting the start of the line as 1. Some measured and gave answers such as 5.2 cm, scoring 0.
	c		Ruled vertical line $x = 2$	1	Accept good freehand and dashed line If more than one vertical line and no clear choice mark the worst, ignore line at $x = -3$ If $y = 2$ also drawn and not rejected, treat as choice Use overlay to check if in doubt At least 2 cm long. If line more than 2 cm then must be in overlay throughout length. <u>Examiner's Comments</u> Around half the candidates scored on this question. A minority gave no answer. The common error was to draw $y = 2$. Most, but not all, used a ruler. Several candidates drew a rectangle to answer this question. A small number of candidates drew a diagonal line and labelled it $x = 2$. Some candidates did not draw a line long enough to be credited. Some used poor freehand or did not draw on the grid line.
	d		$(-3, -2)$	2	B1 for answer $(2, -2)$

					or $(-3, -2)$ seen or plotted on grid If 0 scored, SC1 for answer $(-3, \dots)$ or $(\dots, -2)$ Examiner's Comments Fewer than half the candidates scored marks on this question. A number gained the SC mark for $(-3, \dots)$ or $(\dots, -2)$. Nearly a fifth of candidates did not attempt the question.	Ignore other points
			Total	5		
35	a		0.2 or 0.19 to 0.20 cm per minute or cm/min	2 1	M1 for $\frac{3.8 \text{ to } 4}{20}$ oe If 0 scored, SC1 for triangle with incorrect values marked and <i>their</i> $\frac{\text{rise}}{\text{run}}$ or $\frac{\text{rise}}{\text{run}}$ with answer in range $0.18 \leq g < 0.19$	e.g. $\frac{1.9 \text{ to } 2}{10}$ e.g. $\frac{13}{20}$ with no triangle scores 0 e.g. $\frac{13}{20}$ with 13 and 20 marked on triangle scores SC1 e.g. $\frac{2.1}{11.6}$ and answer 0.181... SC1 Mark for units still available even if wrong gradient Examiner's Comments From Question 16 onwards, many candidates found the questions challenging.

					Very few candidates drew a triangle on the line to create values for the gradient calculation. On the few occasions that triangles were seen they often contained lengths that demonstrated the scales had been misread. Some took a point and divided the y-coordinate by the x-coordinate. Others left the question blank. Almost no one gave units.
	b	i	$5 \times \text{their gradient}$ $13 + \text{their } 1$ giving answer that rounds to 14	M1 M1	FT <i>their gradient</i> which is a number <u>Alternative method</u> M2 for $25 \times (0.19 \text{ to } 0.2) + 9$ with answer that rounds to 14 or M1 for $25 \times \text{their gradient} + 9$ with answer that does not round to 14 <u>Examiner's Comments</u> As part (a) was not well answered this part was rarely attempted. Most of the solutions were imprecise and incorrect. Where candidates did attempt to use their gradient the methods were incorrect. Some tried to create a sequence of times and heights and extrapolate but this gained no marks as it did not use their gradient, as requested in the question.
		ii	Continues to rise at same rate oe or Rises 0.2 cm every minute oe	1	FT <i>their gradient</i> if figures quoted Must imply constant increase [in height] or continued pattern

					If figures used must be correct or from <i>their</i> gradient Accept The pattern continues oe The dough rises consistently oe The dough will rise 1 cm in 5 minutes
					<u>Examiner's Comments</u> A few candidates gave the assumption the dough would continue to rise but they did not indicate 'at the same rate' so did not score the mark.
			Total	6	
36	a	Correct sketch with -2 indicated as y-intercept 	2	B1 for a horizontal line below the x axis	Condone good freehand Line must be at least 10mm
	b	Correct sketch with -3 indicated as y-intercept and 3 indicated as x-intercept 	3	B1 for line with positive gradient and B1 DEP for a line with -3 indicated as y-intercept or for a line with 3 indicated as x-intercept	Condone good freehand Line must be at least 10mm
	c	Correct sketch	1		



curve, correct shape

Condone intention to curve at point (0,0) and length of curve.

Examiner's Comments

Candidates found all parts of this question challenging and there were a significant number of no responses across all 3 parts.

Part (a) was attempted the best with 1 mark commonly given for a horizontal line below the x-axis. Some labelled their line with the equation $y = -2$ but very few successfully indicated -2 as the y-intercept.

In part (b) it was more common to see a line with a negative gradient. Some sketched a line with a positive gradient and scored a mark. Identifying the intercepts proved challenging. Some numbered scales on both axes rather than labelling just the key crossing points. This often resulted in inaccuracy where lines crossed between, e.g., -2 and -3 on the y-axis rather than exactly passing through $(0, -3)$.

It was very rare to see any curves in part (c) and these were not typically centred on $(0, 0)$. Some were drawn completely in the first quadrant, and a few were drawn with a minimum point below $(0, 0)$.

Total

6

37

a

4 : 1 oe

1

Accept 1 : 0.25

b

$\frac{7}{3}$ or $2\frac{1}{3}$

2

M1 for $\frac{14}{6}$ oe

Examiner's Comments

					Candidates found both parts of this question challenging and very few responses were seen.
			Total	3	
38	a		(4, 0)	1	Examiner's Comments Most candidates answered part (a) correctly. The common error was transposing x and y coordinates.
	b		Point plotted at (3, -3)	1	Accept unlabelled if no others Examiner's Comments The most common error was to plot a point at (-3, 3).
			Total	2	
39	a		11 -5	2	B1 for each Examiner's Comments Several fully correct answers were seen. Many candidates scored 1 mark, usually for -5. The first value was often -11 or 21 from incorrectly dealing with the negative sign.
	b		Correct curve	3	B2ft for 7 or 8 points accurately plotted or B1ft for 5 or 6 points accurately plotted Tolerance $\pm \frac{1}{2}$ small square radially 2 1 Examiner's Comments

					Many fully correct answers were seen. Those who attempted this question usually scored at least 1 mark for plotting the given points, with many plotting all the points and gaining 2 marks. Several did not join the points or did so with straight lines. Curves at times were feathered or missed the plotted points and for those who had errors they were not aware of the shape or symmetry of the quadratic curve they were aiming for.
	c		-2.3 or -2.2 2.2 or 2.3	2FT	Strict FT B1 for either FT their graph If curve is between 2 grid lines accept either value as correct answer Do not accept answers to more than 1d.p. Do not allow $\pm \sqrt{5}$ or answers with no graph <u>Examiner's Comments</u> Candidates who realised the need to use the graph often gave the correct answer(s). With curves not drawn, candidates could not use their graph to solve the equation. Some did attempt to use algebra to work out values despite the question stating "use your graph".
			Total	7	
40	a		16	1	Do not accept coordinates Condone $y = 16$ <u>Examiner's Comments</u> Many candidates left the answer line blank. Very little working was seen to support answers and few seemed to appreciate that the value of x had to be 0.

	b	5	1	Do not accept coordinates Condone $x = 5$ <u>Examiner's Comments</u> Results here were similar to those in (a) and few candidates appreciated the symmetry of the graph. 2 and 8 were sometimes given as the answer.
		Total	2	
41		$y = 2x - 18$ with correct working	5	M1 for attempt at $\frac{\text{change in } y}{\text{change in } x}$ A1 for 'm' = 2 M1 for $0 = \text{their}$ 'm' $\times 9 +$ 'c' or $-6 = \text{their}$ 'm' $\times$ $6 +$ 'c' or for $\frac{9}{3} \times [\pm]6$ oe A1 for 'c' = -18 If 0 scored, SC1 for implying the y intercept is -18 with no or insufficient working, may be seen on the diagram or for D is (6, -6) 'correct working' requires evidence of at least M1M1 or M1A1 may be implied on the diagram or may be implied by -2 M1A1 soi by ['m' =] 2 Allow FT from D or <i>their</i> D stated may be implied on the diagram <u>Examiner's Comments</u> Combining the demand of parallelogram properties with the equation of a straight line, this question was by far the least attempted and proved just too difficult for most. The large majority of candidates picked numbers out of the diagram with some attempting substitution into $y = mx + c$, so answers such as $y = -6x + 9$ or $y = 9x - 6$ were extremely common. The first step of recognising the required line would be parallel to AB and therefore

					the gradients would be the same was not considered by most. A few did state “change in y / change in x” but then used the coordinates of the diagonal of the parallelogram, C and A, or used the values given on the x axis. A number tried to use the diagram to find the y-intercept, but given that it was “Not to scale” the common answer was -12. Occasionally a mark was earned for giving the correct coordinate of $(6, -6)$ for D.
			Total	5	
42	a		2 cao	1	<u>Examiner’s Comments</u> This was not well answered. Very few candidates gave a correct gradient, sometimes giving $2x$ or $2x - 1$.
	b	i	$y = 2x + 3$	1	Allow, “The first one” oe for $y = 2x + 3$ <u>Examiner’s Comments</u> The correct equation was sometimes given, but $y = x - 1$ was a popular incorrect response.
		ii	Comment: Rejecting 4 [as gradient] and/or indicating $2 > \frac{1}{2}$	1	<u>Examiner’s Comments</u> Almost no correct responses to part (ii) were given. Sometimes responses hinted at some understanding, but these were poorly stated. A common error was to think that adding all the numbers used gave the greatest gradient.
	c		$2 \times 45 - 1$ soi 89 or $(90 + 1) \div 2$ soi 45.5 oe Below	M1A1	<u>Examiner’s Comments</u> It was often blank or just a statement that the line would pass above/through/below the point, but with no supporting evidence. Very few considered substituting the values in the equation of the line, suggesting little appreciation of why an equation can define a line.

			Total	5	
43	a		Straight line oe Passes through origin oe	1 1	
	b		26	1	
	c		\$195 < \$221 or £150 < £170 With correct working	4	Allow exchange rates of 1.25 to 1.35 leading to \$212.5[0] to \$229.5[0] or £144 to £156 M2 for $195 \div 1.3$ or 170×1.3 A1 for [£]150 or [\$]221 or M1 for a correct exchange rate e.g $26 \div 20$ OR M2 for building up to \$ equivalent of £170 or £ equivalent of \$195 e.g. 17×13 or 8.5×26 or 15×10 A1 for [£]150 or [\$]221 or M1 for building up to £170 or \$195 e.g. 17×10 or 8.5×20 or 15×13 or $170 \div 10 = 17$ OR M2 for $195 \div 13$ and $170 \div 10$ A1 for 15 and 17 or M1 for $195 \div 13 = 15$ or $170 \div 10 = 17$ If 0 scored SC1 for Comparison in symbols or words required Allow FT <i>their</i> value from (b) Allow correctly rounded values used for M marks e.g for £7.69 or £8 for \$10 used

					\$195 < (\$212.5[0] to \$229.5[0]) or (£144 to £156)< £170 <u>Examiner's Comments</u> Many candidates used a 'build up' method rather than calculating the exchange rate. Most of these did score some method marks, but not all arrived at the answer.	
	d		26 or FT their (c)	1 dep	Dep on A1 or SC1 awarded in part (c) Accept 25.99	
			Total	8		
44			E C B F	4	B1 for each Accept correct equations	
			Total	4		
45	a		(3, -4)	1	<u>Examiner's Comments</u> The most common error was to reverse the coordinates, e.g. giving (-4, 3) rather than (3, -4).	
	b		H plotted at (-2, 4)	1	Must be labelled if more than 1 point plotted <u>Examiner's Comments</u> The most common error was to reverse the coordinates.	
			Total	2		
46	a		6 and -3	2	B1 for each	

					<u>Examiner's Comments</u> Few were able to complete the table in this part fully correctly. A number of errors were seen, either due to the squaring or the use of negative numbers. Common errors included (0, 0), (-3, -6), (-3, 12), (-3, 3) and (-3, -3).
	b		Correct curve	3	B2FT for 6 or 7 correct plots B1FT for 4 or 5 correct plots Tolerance ± 1 small square for plotting and curve through correct points. Condone slight feathering – must not be ruled If large blob for plot, check centre of blob <u>Examiner's Comments</u> Many appeared unfamiliar with drawing a quadratic graph as required in this part and a significant number of no responses were seen. Those plotting points usually did so correctly from their table, although a number of untidy plots involving 'large blobs' were seen. Few appreciated that these plots should be joined in a smooth continuous curve; some used straight lines, but many didn't join their points at all.
	c		-2.3 to -2.2 and 2.2 to 2.3	2FT	Strict FT B1 for either FT <i>their</i> graph Tolerance $\pm \frac{1}{2}$ a small square Do not allow exact answers or answers with no graph Do not FT from a straight line graph If more than 2 intersections, B1 for each correct

					intersection on the answer line. If more than 2 answers, mark the worst. <u>Examiner's Comments</u> As this part relied on the drawing of a curve, correct methods and answers were rarely seen. Those who had drawn a curve did not appreciate that the line $y = 2$ also needed to be drawn in order to solve the equation by using the intersection points. A number of candidates attempted to solve this part using algebra, rearranging the equation to $x^2 = 5$ and some solved this to reach $x = \sqrt{5}$. However, as the question stated 'Use your graph', this was a method that did not gain credit.
			Total	7	
47	a		C	1	I <u>Examiner's Comments</u> The correct graph was often chosen in this part. Choice E was the most common error, suggesting some knowledge that direct proportion produces a straight line.
	b		D	1	I <u>Examiner's Comments</u> Candidates were much less successful with their choice in this part. Some recognised the aspect that the graph needed to decrease, but incorrectly chose B.
			Total	2	