Name: _____

Year 9 Algebra Revision

Calculator Paper

Date:

Time: 1 hour 35 minutes

Total marks available: 95

Total marks achieved: _____

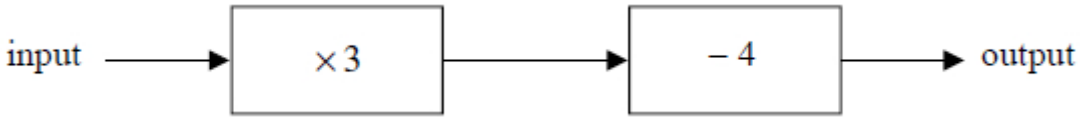
These are hard questions meant to get you thinking.
Please think.

SRH

Questions

Q1.

Here is a number machine.



(a) Work out the **output** when the input is 4

.....

(1)

(b) Work out the **input** when the output is 11

.....

(2)

(c) Show that there is a value of the input for which the input and the output have the same value.

(2)

(Total for question = 5 marks)

Q2.

(a) Simplify $d + d + d + d$

.....

(1)

(b) Simplify $3f + 4 - 2f + 6$

.....

(2)

(Total for Question is 3 marks)

Q3.

Make p the subject of the formula $y = 3p^2 - 4$

. . . . . .

(Total for Question is 3 marks)

Q4.

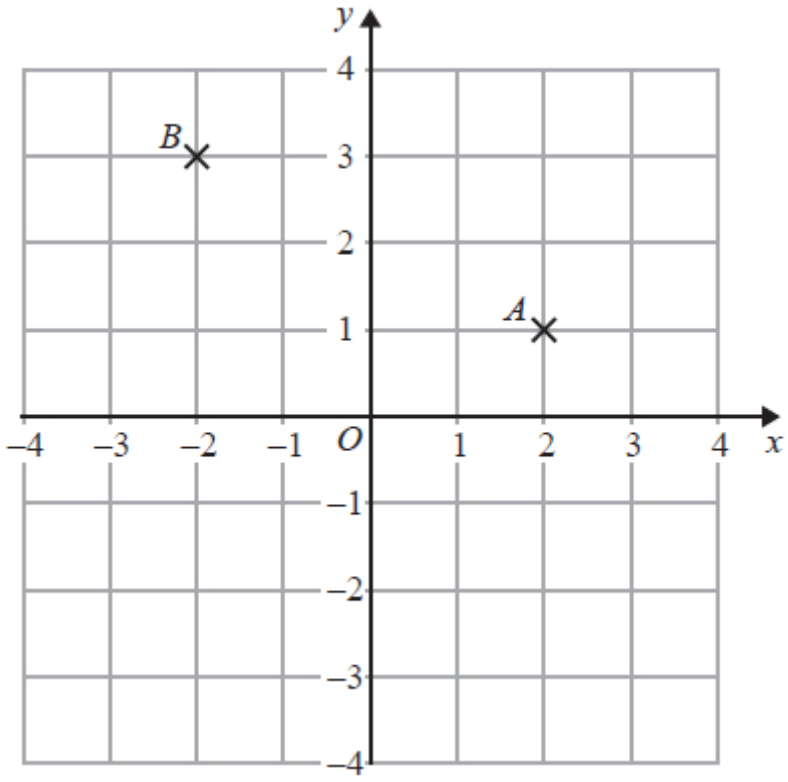
$$q = \frac{p}{r} + s$$

Make p the subject of this formula.

.....

(Total for question = 2 marks)

Q5.



(a) Write down the coordinates of the point *A*.

(..... , ...)

(1)

(b) Write down the coordinates of the point *B*.

(..... , ...)

(1)

(c) On the grid, mark with a cross (×) the point (−3, −1).
Label this point *C*.

(1)

(d) On the grid, draw the line $x = 3$

(1)

(Total for question = 4 marks)

Q6.

(a) Simplify $3y + 2x - 4 + 5x + 7$

.....

(1)

(b) Factorise $2x^2 - 4x$

.....

(2)

(c) Expand and simplify $11 - 3(x + 2)$

.....

(2)

(d) Expand and simplify $(x - 6)(3x + 7)$

.....

(2)

(Total for Question is 7 marks)

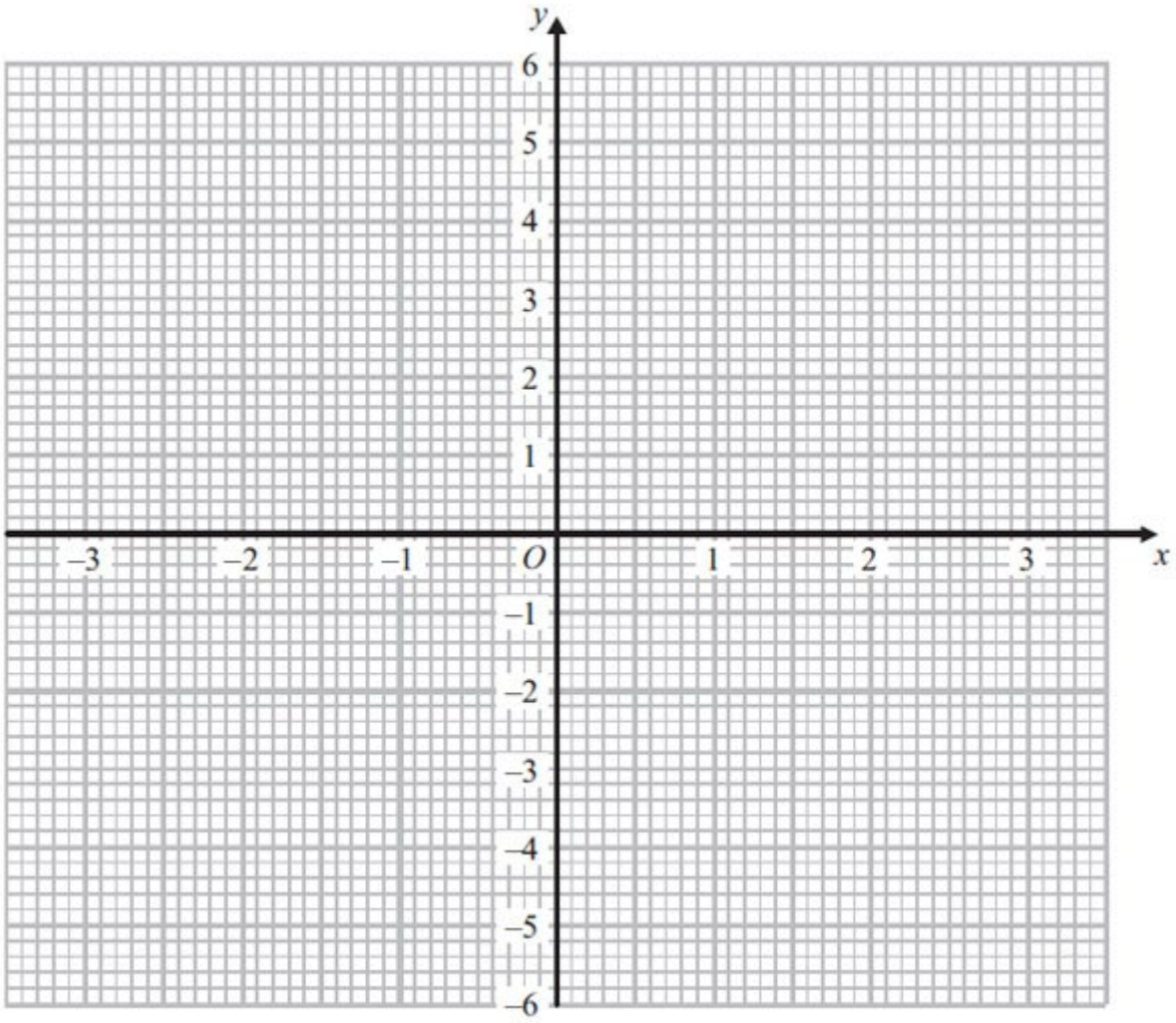
Q7.

(a) Complete the table of values for $y = x^2 - 4$

x	−3	−2	−1	0	1	2	3
y		0	−3			0	5

(2)

(b) On the grid, draw the graph of $y = x^2 - 4$ for $x = -3$ to $x = 3$



(2)

(Total for Question is 4 marks)

Q8.

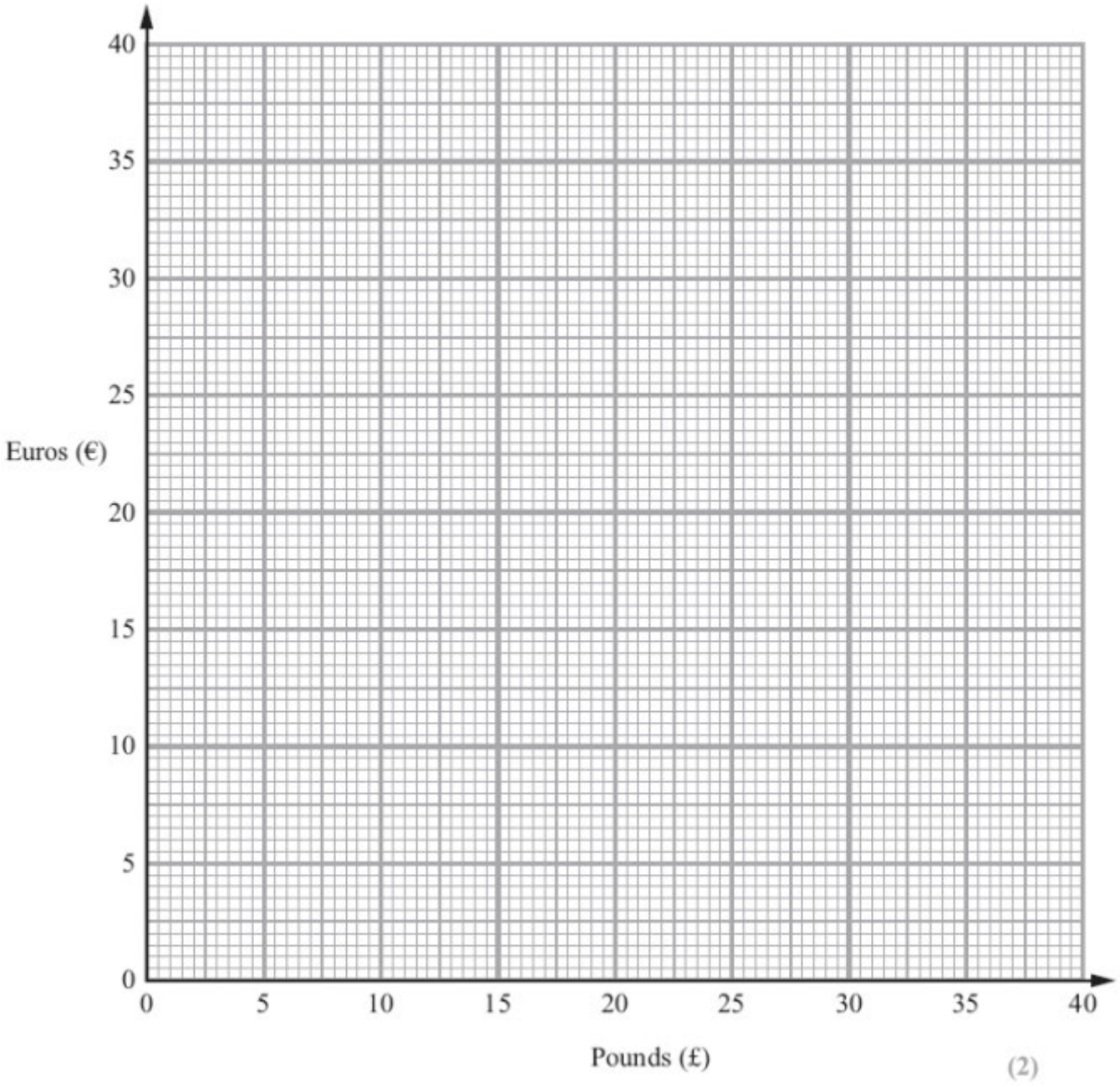
The exchange rate for pounds (£) to euros (€) is £1 = €1.20

(a) Complete the table of values.

£	0	1	5	10	15	20	25	30
€		1.20	6			24	30	

(2)

(b) On the grid, draw a conversion graph for pounds (£) to euros (€).



(2)

Louise changes £250 into euros.

(c) Work out how many euros Louise should get.

. . . . . euros

(2)

(Total for Question is 6 marks)

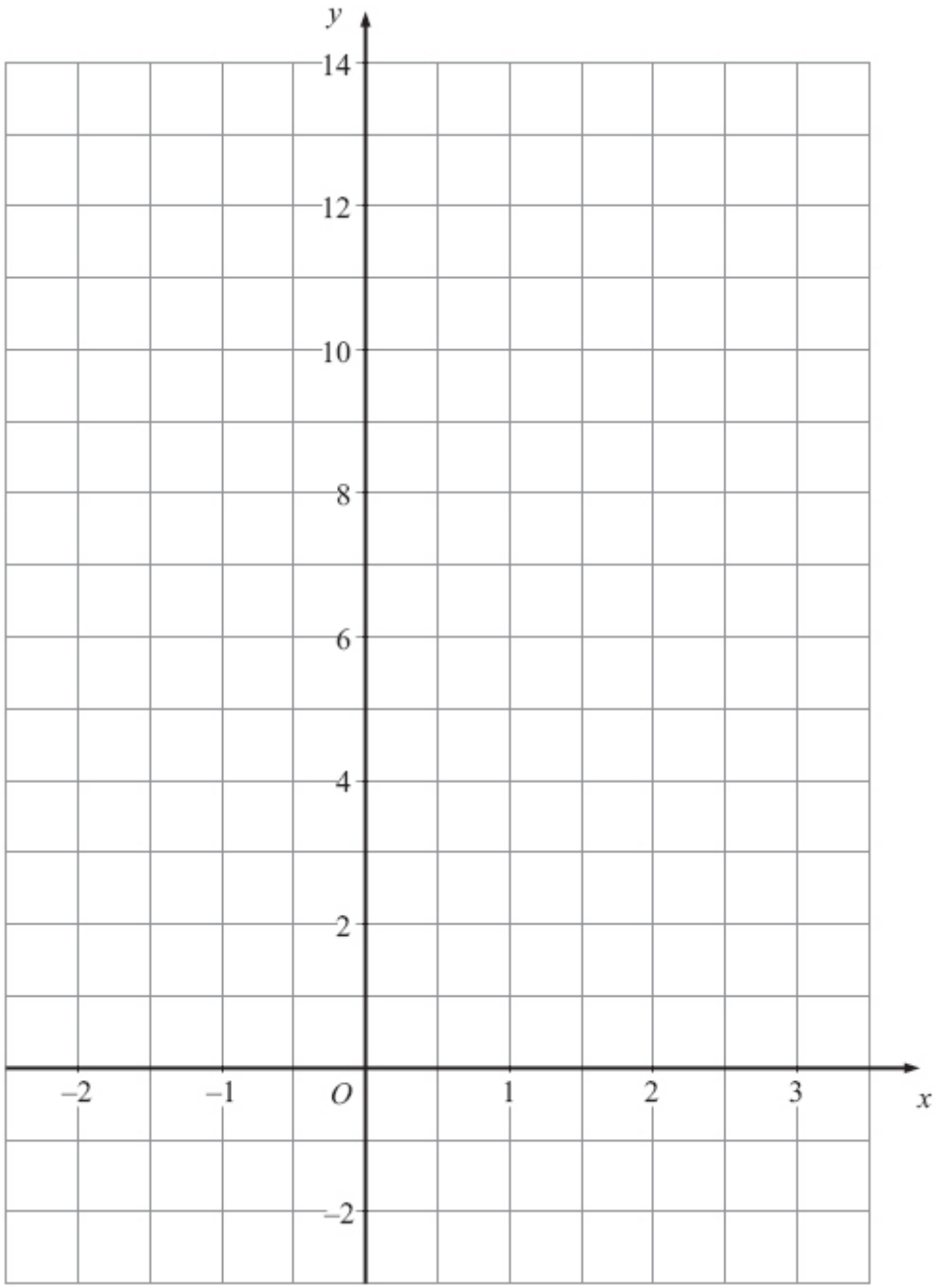
Q9.

(a) Complete the table of values for $y = 3x + 4$

x	–2	–1	0	1	2	3
y		1				13

(2)

(b) On the grid, draw the graph of $y = 3x + 4$

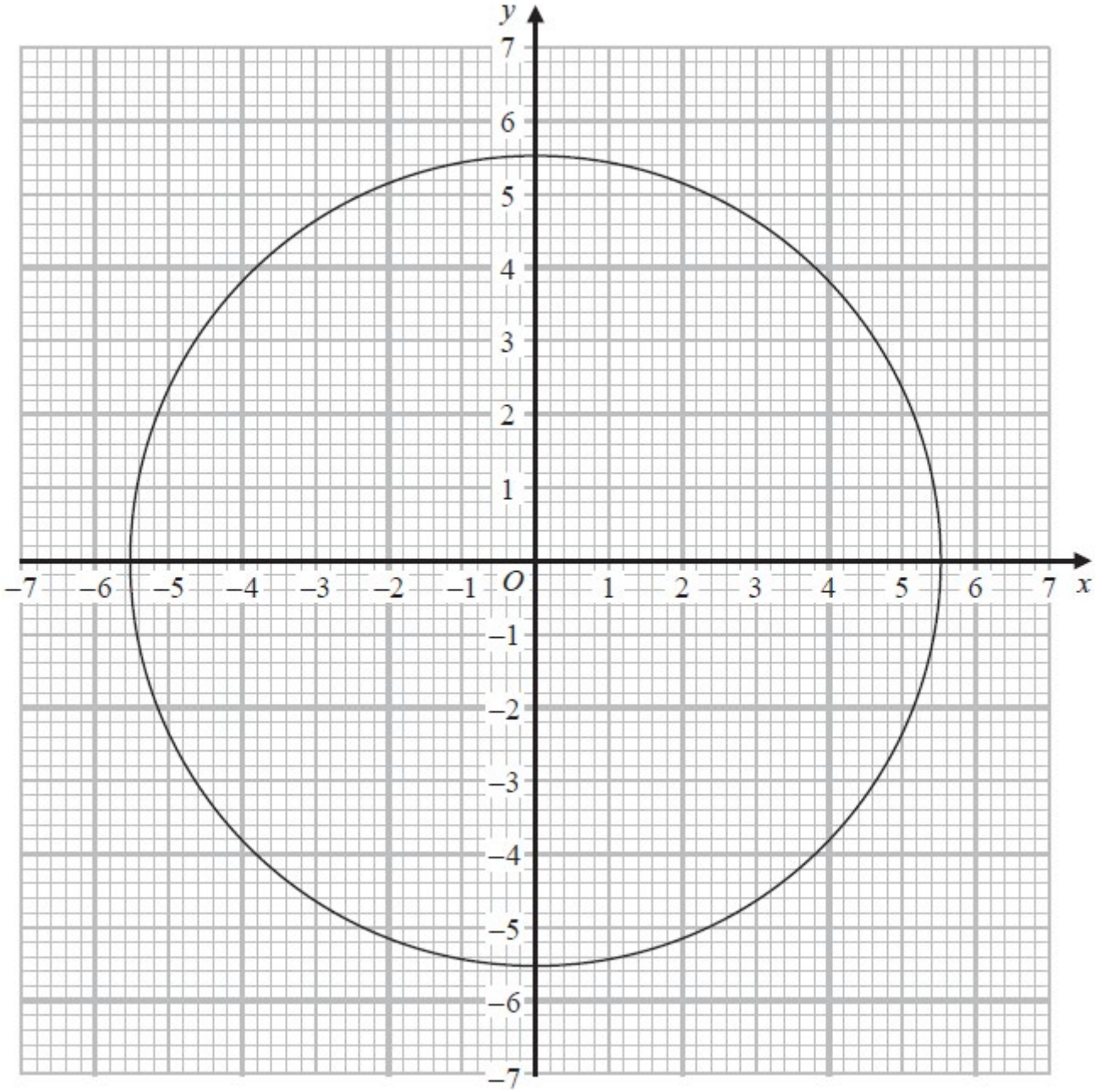


(2)

(Total for Question is 4 marks)

Q10.

The diagram shows the graph of $x^2 + y^2 = 30.25$



Use the graph to find estimates for the solutions of the simultaneous equations

$$x^2 + y^2 = 30.25$$
$$y - 2x = 1$$

.....

(Total for question = 3 marks)

Q11.

Make *a* the subject of $a + 3 = \frac{2a + 7}{r}$

.....

(Total for question = 3 marks)

Q12.

* **A** and **B** are straight lines.

Line **A** has equation $2y = 3x + 8$

Line **B** goes through the points (−1, 2) and (2, 8)

Do lines **A** and **B** intersect?

You must show all your working.

(Total for Question is 3 marks)

Q13.

Solve the simultaneous equations

$5x + 2y = -2$

$3x - 5y = 11.2$

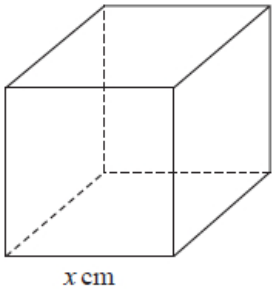
x = ...

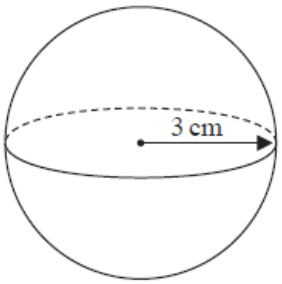
y = ...

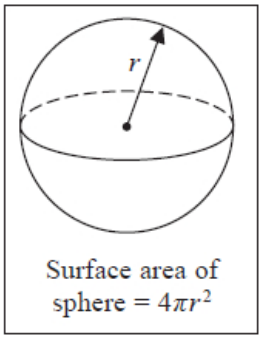
(Total for question = 4 marks)

Q14.

The diagram shows a cube with edges of length x cm and a sphere of radius 3 cm.







The surface area of the cube is equal to the surface area of the sphere.

Show that $x = \sqrt{k\pi}$ where k is an integer.

(Total for question = 4 marks)

Q15.

3 teas and 2 coffees have a total cost of £7.80

5 teas and 4 coffees have a total cost of £14.20

Work out the cost of one tea and the cost of one coffee.

tea £ .....

coffee £ .....

(Total for question = 4 marks)

Q16.

(a) Simplify $(p^3)^2$

.....

(1)

(b) Simplify $\frac{t^8}{t^3}$

.....

(1)

$2^3 \times 2^n = 2^9$

(c) Work out the value of n.

.....

(1)

$2x^3 = 128$

(d) Work out the value of x.

.....

(1)

(Total for Question is 4 marks)

Q17.

$x = 0.7$

Work out the value of $\frac{(x+1)^2}{2x}$

Write down all the figures on your calculator display.

.....

(Total for Question is 2 marks)

Q18.

The diagram shows a trapezium.

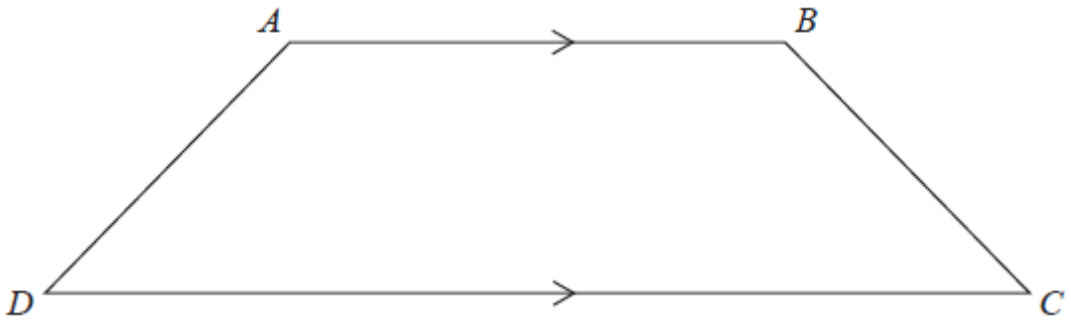


Diagram **NOT** accurately drawn

AD = *x* cm.
BC is the same length as *AD*.
AB is twice the length of *AD*.
DC is 4 cm longer than *AB*.

The perimeter of the trapezium is 38 cm.

Work out the length of *AD*.

.....cm

(Total for Question is 4 marks)

Q19.

Peter has to subtract $(x^2 - 2x - 4)$ from $(x^2 + 3x + 5)$

Here is his working

$(x^2 + 3x + 5) - (x^2 - 2x - 4)$
$= x^2 + 3x + 5 - x^2 - 2x - 4$
$= x + 1$

Explain what is wrong with Peter's working.

.....

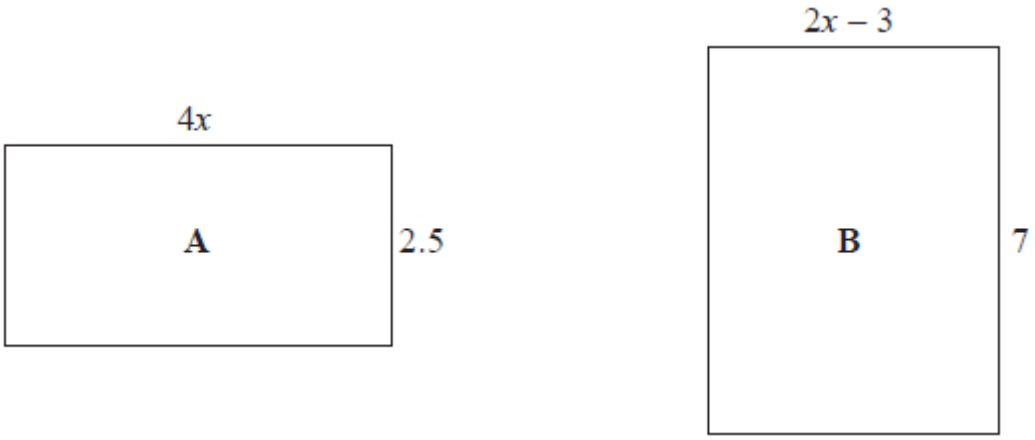
.....

.....

(Total for question = 1 mark)

Q20.

Here are two rectangles.



All measurements are in centimetres.

The area of rectangle **A** is equal to the area of rectangle **B**.

Work out the perimeter of rectangle **B**.

..... cm

(Total for question = 5 marks)

Q21.

(a) Work out the value of 3.1^4

.....

(1)

(b) Simplify $(p^3)^2$

.....

(1)

(c) Simplify $t^8 \div t^3$

.....

(1)

$2^3 \times 2^n = 2^9$

(d) Work out the value of n.

.....

(1)

(Total for Question is 4 marks)

Q22.

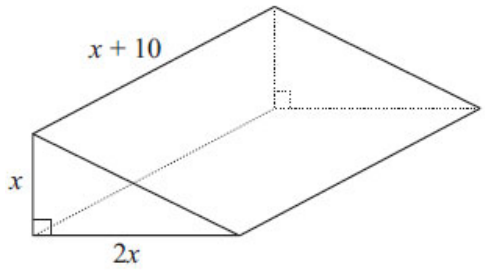


Diagram **NOT** accurately drawn

The diagram shows a solid triangular prism.
All the measurements are in centimetres.

The volume of the prism is V cm^3.

Find a formula for V in terms of x.
Give your answer in simplified form.

.....

(Total for Question is 3 marks)

Q23.
(a) Simplify $5x + 4y + x - 7y$

.....

(2)

(b) Solve $7(x + 2) = 7$

.....

(2)

(Total for Question is 4 marks)

Q24.

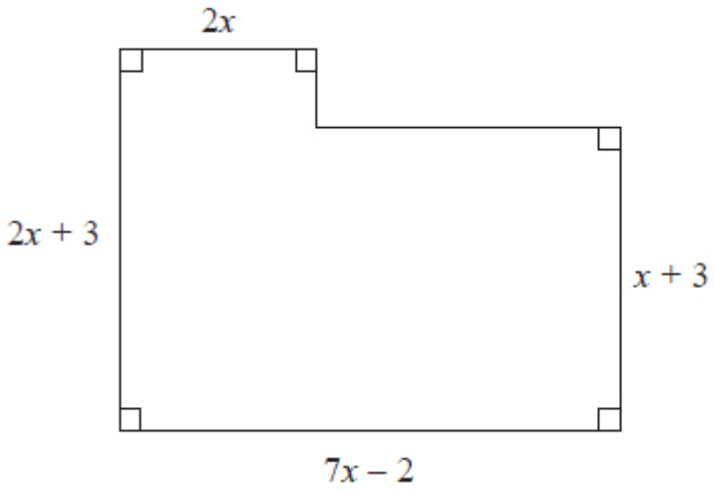


Diagram **NOT** accurately drawn

All the measurements in the diagram are in centimetres.

The area of the shape is A cm^2.

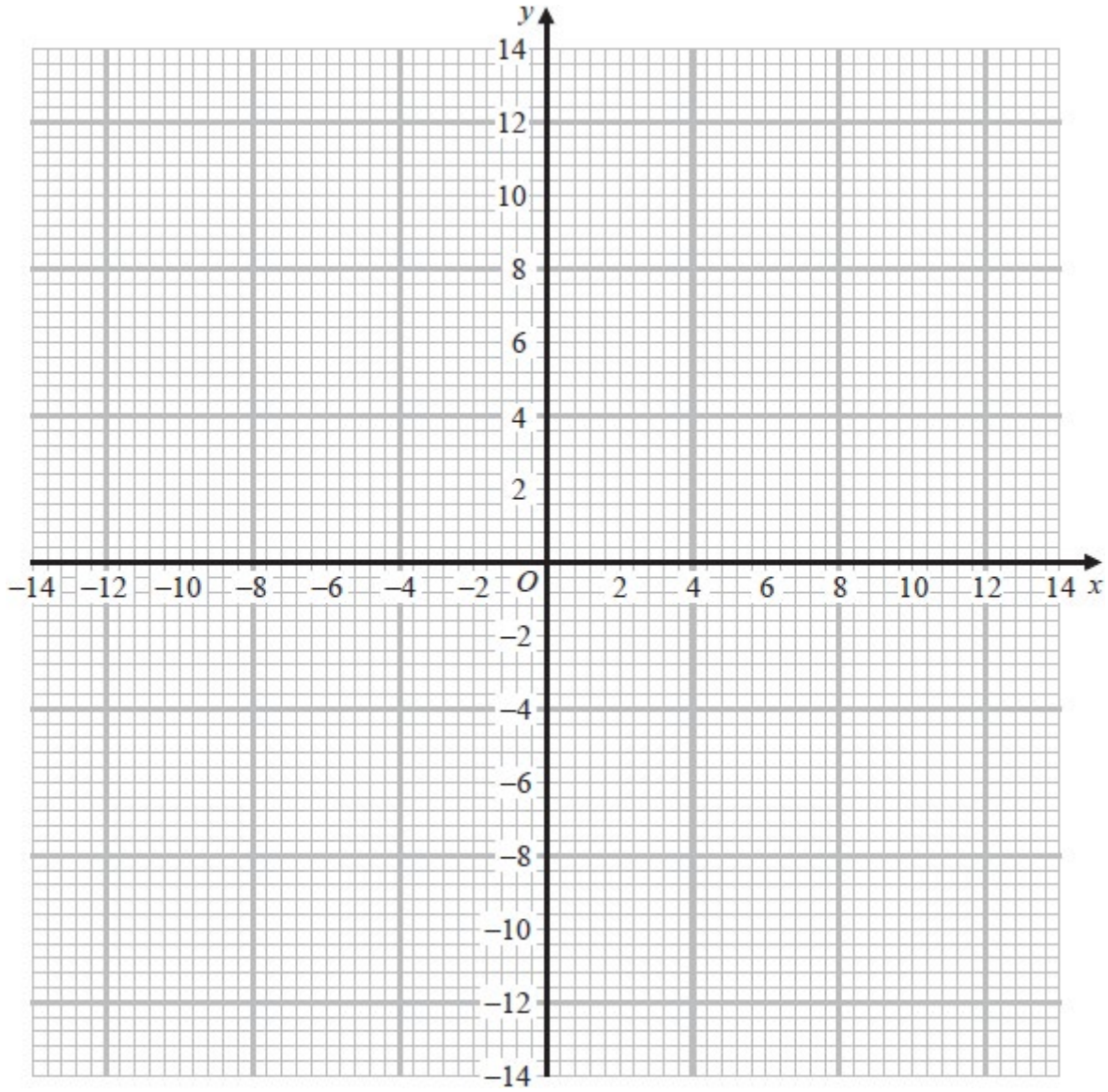
Find a formula for A in terms of x.
You must write your formula as simply as possible.

.....

(Total for question = 4 marks)

Q25.

(a) On the grid, draw the graph of $x^2 + y^2 = 169$



(2)

(b) Use your graph to find estimates for the solutions of the simultaneous equations

$$x^2 + y^2 = 169$$

$$2y = 3x$$

.....

(3)

(Total for question = 5 marks)

Examiner's Report

Q1.

No Examiner's Report available for this question

Q2.

Part (a) was successfully answered by about 80% of candidates. Others generally involved indices in their answers with not only d^4 commonly seen but also 4^d. Candidates could be reminded of the need for clear writing in their answers so that $4d$ never looks more like 4^d.

In part (b) the negative sign associated with the $2f$ term caused difficulties. Some candidates ignored it and added $2f$ to $3f$ instead. Others linked it with the preceding 4 instead and often gave $f - 10$ as their final answer. It may be helpful to encourage students to circle or underline each like term together with its preceding sign. Many candidates who gave the correct expression $f + 10$ in their working spoilt their final answer by further incorrect simplification to $11f$.

Q3.

Many candidates showed poor understanding of the order of the steps required and misplaced signs or lost terms caused errors. The most common first step appeared to be showing an intention to add 4 to both sides. There were some candidates that tried dividing through by 3, however this was far less successful.

Most candidates realised they had to find a square root somewhere, but frequently this was done too early in the process, before an equation of the form $p^2 =$ had been formed.

A significant minority found the square root of the numerator only, but of concern are those candidates whose presentation of the answer was ambiguous: it was not clear whether the square root was intended to go over the entire fraction or not; some missed off the "$p =$" from their final answer. Full marks could not be awarded in these cases. The use of flow diagrams rarely led to any marks.

Q4.

No Examiner's Report available for this question

Q5.

The first three parts of this question were answered well, the only error being those who reversed the coordinate values, though it was not uncommon to see this error only in the first two parts. In part (d) many offered y=3 as the line, or a diagonal line through the point (3,0).

Q6.

Approximately two thirds of candidates gave the correct answer to part (a) of this question. Where a candidate's response was not correct, this was usually due to the presence of "-3" or "$-3x$". In part (b) almost 70% of candidates were able to identify at least one factor of $2x^2 - 4x$. However many attempts showed only partial factorisation or a lack of care and less than a half of candidates scored full marks.

Candidates are reminded that their answers may be checked by multiplying out the brackets. Fully correct answers to part (c) of this question were quite rare. 14% of candidates scored 2 marks here with a further 4% of candidates scoring 1 mark for a correct expansion of $-3(x + 2)$ followed by an incorrect final answer. It is disappointing to report that many candidates did not appreciate the need to expand the brackets first. Many answers of "$8x + 16$" were seen.

Many candidates expanded the expression in the same way as they would for a quadratic expression, writing down 4 terms from an expansion of $(11 - 3)(x + 2)$ before collecting like terms. Those who did attempt to expand $-3(x + 2)$ first, often gave "$-3x + 6$" as their expansion. Expansion of the quadratic expression in part (d) was done more successfully, though there were many errors in signs and in evaluating 6 multiplied by 7. Some candidates tried to combine terms in "x" with terms in "x^2". About two fifths of candidates scored 2 marks for this part of the question and a further one quarter of candidates scored 1 mark for a partially correct expansion.

Q7.
Most candidates made good attempts at this final question. A small number of candidates scored one mark for getting at least one value in the table correct but then not plotting at least five of their points correctly. The most common error in completing the table was to write −5 instead of 5 for the value of y when x was −3.

Most candidates were able to plot their points from the table accurately to gain one mark in part (b). Many went on to draw a correct curve to gain the second mark and in some cases recovered from incorrect values in the table.

Around a third of the candidates scored all four marks with many of the candidates who scored three marks either failing to join their correctly plotted points or joining their points with straight lines.

> **Results Plus: Examiner Tip**
> Candidates should know that a quadratic expression gives rise to a parabola. In part (a), many calculated the y-value to be −5 when x was −3. This resulted in a curve that was clearly not a parabola. This should have alerted candidates to realise they had made an incorrect calculation.

Q8.
Part (a) of this question was well attempted with most candidates writing in 4 values, however, their values were often incorrect. The zero value caused the most problems with a common incorrect response being €0.20. €35 was another common incorrect response for £30.

Part (b) was the least successful part of this question. Although many candidates did score B2 for a fully correct line, the scale of two 2mm squares to 1 unit caused problems for many others. Having incorrect values in part (a) also prevented students achieving B2 but they did, in some cases, achieve B1 for plotting their points. A few candidates, whether they had responses in part (a) or not left part (b) blank.

Despite problems in part (b) some candidates still went on to gain M1A1 in part (c) realising that they could use £25 = €30, or any other given value, from the table though often correct answers of 300 were not supported by any working out. Several candidates gained M1 for 1.20×250 but did not arrive at 300 for the correct answer.

Q9.
This traditional question was surprisingly not well answered. It was uncommon to find a completely correct table of values. There were many errors in plotting points, and too many who presented a set of points through which a line was not drawn. This was a question in which candidates should have scored highly, but failed to do so.

Q10.
This question was poorly answered with relatively few students achieving any marks. For those who drew the graph of $y - 2x = 1$ it was common to see at least two marks awarded if not all three. When one of the accuracy marks was lost this was usually due to the values not being given as pairs or an error being made when reading from the graph. Not all attempts at drawing the graph of $y - 2x = 1$ were successful. Some students attempted an algebraic approach despite the question directing them to use the graph but these attempts were doomed to failure on this non-calculator paper and gained no marks.

Q11.
No Examiner's Report available for this question

Q12.
There were many different approaches to this question, but equally many who chose not to attempt it. A significant number substituted (−1,2) and (2,8) in turn into the equation of line A, hoping to find the point of intersection. Some tried to draw sketches of the lines, but usually these were not sufficiently accurate, and needed to be supported with additional working. Few candidates were able to work out the gradient of the line B correctly. Some appeared to that the

lines would only intersect if they were perpendicular. The best solutions came from using the equation of line B as $y=2x+4$ and equating the y-intercept on both lines. Some compared the gradient with equal success.

Q13.

Only a small proportion of students scored full marks here. Many students multiplied each of the equations through by a constant to ensure that either the coefficients of x or the coefficients of y were such that terms in that variable could be eliminated by either subtraction or addition of the two equations. Unfortunately, students did not indicate whether they intended to add or subtract the equations and accompanying errors often meant that it was not possible to give any marks to reward a correct method. It seemed that most students did not really understand what to do at this stage. Some students did manage to retrieve the situation to some extent by showing a correct substitution of one value as a method to find the value of the other.

Q14.

This question was not well answered. Some students gained a mark, usually for substituting 3 into the given formula for the surface area of the sphere. Some gave a numerical value for pi and attempted to find the surface area of the sphere, with varied success.

Q15.

Forming and solving simultaneous equations proved to be where many students stopped gaining marks. Many students attempted to solve this problem through a trial and improvement method, normally with little or no success. Of those who gained a mark for forming 2 equations, many then had no strategy for solving them. Those who did have a strategy often made arithmetic errors leading to incorrect answers.

Q16.

Parts (a) and (b) were usually well answers, the only common errors being the addition of indices in part (a). In part (c) most candidates earned the mark, but some failed to subtract 3 correctly from 9, or divided it. An answer of 2^6 was accepted. It was disappointing how many candidates were unable to see the way to finding the answer. Many attempted trial & improvement approaches, whilst for many it was knowing what to do with the 64, resulting in many divisions by 3, or failed attempts to find the cubed root on the calculator.

Q17.

This question was very well done by the majority, clearly well prepared for this. Some candidates did not appreciate the order of operations on the calculator and failed to get the accuracy mark provided they showed the substitution in to the expression. The candidates that were not well prepared often split the expression when making the substitution and so did not gain marks if the answer was incorrect. A few students did not give the answer to sufficient decimal places, but they were very much in the minority.

Q18.

This question was a good discriminator. Many candidates labelled AB correctly and were awarded 1 mark. However, a common mistake was to think DC was 4 times longer than AB instead of 4cm longer, with $8x$ or $x + 4$ often seen on the diagram. Another common, though lesser seen problem appeared to be pupils becoming confused between the act of doubling a side and squaring it, leading to AB being labelled as x^2. Those taking the algebraic route usually attempted to add the 4 sides together and could simplify their expression. It was disappointing to see that so many candidates could not put together an algebraic argument and resorted to Trial and Improvement, usually stopping at an x value of 5.665. It must also be noted that many candidates used decimals and not fractions, but did not appreciate the difference between terminating and recurring decimals. Candidates need to understand that a recurring number is a perfectly acceptable answer and best left in fraction form $^{34}/_{6}$, or $^{17}/_{3}$ or $5\ ^{2}/_{3}$. Rounding or truncating an answer does not always gain the accuracy mark.

Q19.

This question was quite well answered. It was expected that candidates would refer in some way to the change in signs needed for the last two terms in the expansion. The question asked "what is wrong with Peter's working". Candidates who simply gave a correct final answer had not

responded to the question and so could not be awarded the mark. There were also many answers which were too vague. In particular, examiners regarded the response "he should expand the brackets first" as not giving sufficient clarity or detail to be deserving of the mark. Some candidates were concerned that the order of the two pairs of brackets should be the other way round.

Q20.

No Examiner's Report available for this question

Q21.

This question about powers proved a bit too difficult for many candidates. Part (a) was the best answered as candidates could use their calculators to work out the correct answer but after this candidates did struggle with p^5 often being given as an incorrect answer for (b). Part (c) was usually better answered and in part (d) a few more gave the correct answer of 6.

Q22.

Many candidates started this problem correctly by intending to multiply the three expressions. But few were then able to manipulate the expressions in order to produce a simplification. Over-simplification spoilt some answers that would otherwise have been correct. Candidates earned little credit when adding the expressions, trying to find the surface area, or failing to divide by 2 for a triangle, of which there were a significant number. As with all formulae, there was a need for a left hand side to the formula; very few included "V=" in their stated formula, which regrettably was a mark lost, an issue worth raising with future candidates.

Q23.

It was disappointing that a third of Higher Tier candidates could not gain full marks for collecting like terms in part (a) of this question and that 8% scored no marks at all. The most common errors seen were + 3y or 6x + − 3y or collecting x + 5x as 5x^2 or 4y − y as 4.

The performance in solving an equation in part (b) was a little better with a quarter scoring one mark for expanding the bracket and about a half gaining full marks for the correct solution, although some were not able to complete the division correctly and gave an answer of 1 or $^7/_{-7}$. A few gave the answer embedded in the equation and were penalised.

Q24.

This question was not well answered with few students getting this fully correct. Many scored 1 mark for either finding the length of one of the two missing sides or, more commonly, finding the area of a rectangle. A few managed to get the correct simplified expression for the area but nearly all of these students lost the final mark as they left their answer as an expression and not a formula.

Q25.

In part (a) a number of students recognised $x^2 + y^2 = 169$ as being the equation of a circle and many of these students drew an accurately constructed circle and gained two marks. Quite a few circles were drawn freehand, suggesting that some students did not have a pair of compasses, but these circles were only awarded two marks if they closely approximated to the correct circle. Some students scored a single mark for drawing a circle with centre (0, 0) with an incorrect radius or for attempting to draw a circle with radius 13 and centre (0, 0).

Students were less successful in part (b). Nevertheless, some students scored one mark for drawing the line $2y = 3x$ and they were often able to use the line to find estimates for the solutions of the simultaneous equations. The final mark was sometimes lost because students did not match the values in pairs or because they found the values of x but did not find the corresponding values of y. Students who only scored one mark in part (a) were able to score follow through marks for correct work in part (b). A number of students chose to ignore the instruction to "use your graph" and attempted an algebraic approach. They gained no credit.

Mark Scheme

Q1.

Paper 1MA1: 3F			
Question	Working	Answer	Notes
(a)		8	B1
(b)	$11 + 4 = 15$ $15 \div 3 = 5$	5	M1 Start of method A1
(c)	in: 0, 1, 2, 3, 4 out: -4, -1, 2, 5, 8	2	M1 For complete method that leads to answer eg. table of values or $x = 3x - 4$ C1 For 2 or for statement that the equation has a unique solution

Q2.

Question	Working	Answer	Mark	Notes
(a)		$4d$	1	B1 accept $4 \times d$, $d \times 4$, $d4$
(b)		$f + 10$	2	M1 for f or $1f$ or 10 or for $3f$ $2f$ and $4 + 6$ A1 for $f + 10$ (accept $1f + 10$)

Q3.

		Working	Answer	Mark	Notes
		$3p^2 = y + 4$ $p^2 = {}^{y+4}/_{3}$	$p = \sqrt{\frac{y+4}{3}}$	3	M1 for clear intention to add 4 to both sides or divide all terms by 3(with at least 3 terms) M1 for clear intention to find the square root from $p^2 =$ (expression in y) A1 for $p = \sqrt{\frac{y+4}{3}}$ oe (accept ± a correct root)

Q4.

Paper 1MA1: 2F			
Question	Working	Answer	Notes
		$p = qr - sr$	M1 for multiplying all 3 terms by r or isolating p/r term A1 oe

Q5.

PAPER: 1MA0_1F				
Question	Working	Answer	Mark	Notes
(a)		2, 1	1	B1 cao
(b)		–2, 3	1	B1 cao
(c)		Point marked	1	B1 for point marked at (–3, –1)
(d)		Line $x = 3$ drawn	1	B1 for line $x = 3$ drawn

Q6.

Question	Working	Answer	Mark	Notes
(a)		$3y + 7x + 3$	1	B1 cao
(b)		$2x(x – 2)$	2	B2 for $2x(x – 2)$. Accept $2x(x + –2)$. (B1 for $x(2x – 4)$ or $2(x^2 – 2x)$ or $2x$(linear expression in x) or $(x – 2)$(linear expression in x)
(c)	$11–3x – 6$	$5–3x$	2	M1 for expansion of $–3(x + 2)$ A1 cao
(d)	$3x^2+7x–18x–42$	$3x^2– 11x – 42$	2	M1 for 4 terms correct with or without signs or 3 out of exactly 4 terms correct (the terms may be in an expression or table) **OR** $x(3x+7)–6(3x+7)$ or $3x(x – 6) + 7(x – 6)$ A1 cao

Q7.

		Working	Answer	Mark	Notes
	(a)		5, −4, −3	2	B2 for 5, −4 and −3 (B1 for 5 or −4 or −3)
	(b)		correct curve	2	B2 for fully correct curve (B1 ft for at least 5 points plotted correctly)

Q8.

Question		Working	Answer	Mark	Notes
	(a)		**0**, 1.20, 6, **12**, **18**, 24, 30, **36**	2	B2 for a fully correct table [B1 for 2 correct entries]
	(b)		Single line from (0, 0) to (30, 36)	2	B2 for a fully correct graph [B1 for at least 4 points plotted correctly or for a single line from (0,0) or for a short straight line segment joinning any two correct points]
	(c)	250 × 1.2 OR 30 × 10 from table Or for values read from the graph and used	300	2	M1 for correct use of any point the table or any point on the graph, eg 250 × 1.2 or 30 × 10 oe A1 **ft** for 300

Q9.

Question	Working	Answer	Mark	Notes
(a)		-2, (1), 4, 7, 10, (13)	2	B2 for 4 values correct (B1 for 2 or 3 values correct)
(b)		Single line from (-2, -2) to (3, 13)	2	M1 for plotting at least 5 of their points correctly **OR** single straight line with positive gradient passing thro' (0,4) from $x = -2$ to $x = 3$ **OR** single straight line of gradient 3 from $x = -2$ to $x = 3$ **OR** correct straight line that passes through 3 correct points A1 cao for correct straight line from at least (-2,-2) to (3,13)

Q10.

Question	Answer	Mark	Mark scheme	Additional guidance
	$x = 2.1, y = 5.1$ $x = -2.9, y = -4.7$	M1	for drawing the graph of $y - 2x = 1$	
		A1	for one correct pair of values **or** for both correct x values, **or** for both correct y values	For both A marks accept answers in the ranges $x = 2.0$ to 2.2, $y = 5.0$ to 5.2 $x = -2.8$ to -3.0, $y = -4.6$ to -4.8 Accept values given as coordinates
		A1	for both correct pairs, correctly matched	

Q11.

Paper 1MA1: 1H			
Question	**Working**	**Answer**	**Notes**
		$a = \dfrac{7-3r}{r-2}$	M1 Remove fraction and expand brackets M1 Isolate terms in a A1

Q12.

PAPER: 1MA0_2H				
Question	Working	Answer	Mark	Notes
*		Yes with explanation	3	M1 For **Line A**: writes equation as $y = 1.5x + 4$ or gives the gradient as 1.5 or constant term of 4 OR for **Line B**: shows a method which could lead to finding the gradient or gives the gradient as 2 or constant term of 4 or calculates a sequence of points including (0,4) or writes equation of line as $y = 2x + 4$ M1 Shows correct aspects relating to an aspect of Line A and an aspect of Line B that enables some comparison to be made eg gradients, equations or points. C1 for gradients 1.5 **and** 2 **and** Yes **with** explanation that the gradients are different or states the lines intersect at (0,4) or explanation that interprets common constant term (4) from equations OR M1 for a diagram that shows both lines drawn and intersecting at (0,4) M1 for a diagram that shows both lines and their intersection point identified as (0,4) C1 for Yes and states the intersection point as (0,4)

Q13.

PAPER: 5MB3H_01				
Question	Working	Answer	Mark	Notes
		$x = 0.4$, $y = -2$	4	M1 for a correct method leading to either x or y (condone one error) A1 for $x = 0.4$ or $y = -2$ M1 for a correct substitution into one of the equation or a correct method leading to the second value A1 cao

Q14.

Question	Answer	Mark	Mark scheme	Additional guidance
	Shown	M1	for a correct expression for the area of one face of the cube, eg. x^2 **or** a correct expression for the surface area of the cube, eg $6 \times x^2$	No marks for $x = \sqrt{6\pi}$ without any working.
		M1	for a correct expression for the surface area of the sphere, eg $4 \times \pi \times 3^2$ ($= 36\pi$)	
		M1	for forming a suitable equation, eg $6 \times x^2 = 4 \times \pi \times 3^2$ **or** $6x^2 =$ "36π"	$6 \times x^2 = 4 \times \pi \times 3^2$ $x^2 = 36\pi \div 6$ $x = \sqrt{6\pi}$
		A1	for completing the method to $x = \sqrt{6\pi}$ or $k = 6$	

Q15.

Question	Working	Answer	Mark	Notes
		Tea £1.40	P1	for setting up two appropriate equations eg $3t + 2c = 7.80$, $5t + 4c = 14.20$
		Coffee £1.80	M1	for method to eliminate one variable, condone one arithmetic error
			M1	for method to substitute found variable or start again
			A1	Tea £1.4(0) and Coffee £1.8(0) with amounts linked to correct drinks

Q16.

PAPER: 1MA0_2H					
Question		Working	Answer	Mark	Notes
	(a)		p^6	1	B1 cao
	(b)		t^5	1	B1 cao
	(c)		6	1	B1 cao
	(d)		4	1	B1 cao

Q17.

PAPER: 1MA0_2H					
Question		Working	Answer	Mark	Notes
			2.064(285714…)	2	M1 for substitution of 0.7 into expression or 2.89 or 2.06 seen A1 for 2.064(285714…) or $\frac{289}{140}$

Q18.

PAPER: 1MA0_2H					
Question		Working	Answer	Mark	Notes
			$5\frac{2}{3}$	4	M1 for $AB = 2x$ or $DC = 2x + 4$ or for $38 - 4$ M1(dep) for x + "x" + "$2x$" + "$2x + 4$" or for "$38 - 4$" ÷ 6 M1 for "$6x + 4$" = 38 A1 for $5\frac{2}{3}$ oe NB: Accept answers in the range 5.6 to 5.7 if M3 scored. SC if M0 then B2 for answer in range 5.6 – 5.7

Q19.

Question	Answer	Mark	Mark scheme	Additional guidance
	Explanation	C1	for full explanation indicating the problem with the negative signs **Acceptable examples** He should have $+2x + 4$ on the second line He should have done $- -4$ and $- -2x$ $3x - -2x = 5x$, not $1x$ Two minuses make a plus which he didn't account for **Not acceptable examples** He has not expanded the brackets Peter has to factorise first He did not collect the terms He didn't include the x^2	

Q20.

Question	Working	Answer	Mark	Notes
		29	P1	for process of forming an expression for one area, egg $2.5 \times 4x$, $7(2x - 3)$
			P1	for process of forming an equation, e.g. $10x = 7(2x - 3)$ or $10x = 14x - 21$
			P1	for complete process to solve the equation to find the value of $4x$ or the value of x
			A1	for $4x = 21$ or $x = 5.25$ oe
			B1	ft using found value of x or $4x$ in perimeter of B: $4x + 8$

Q21.

PAPER: 1MA0_2F					
Question		Working	Answer	Mark	Notes
	(a)		92.3521	1	B1 cao
	(b)		p^6	1	B1 cao
	(c)		t^5	1	B1 cao
	(d)		6	1	B1 cao

Q22.

Question		Working	Answer	Mark	Notes
		$\frac{1}{2} \times 2x \times x \times (x + 10)$	$V = x^3 + 10x^2$	3	M1 for $\frac{1}{2} \times 2x \times x \times (x + 10)$ A1 for $x^3 + 10x^2$ or $x^2(x + 10)$ B1 for V = cubic expression in x

Q23.

		Working	Answer	Mark	Notes
	(a)		$6x - 3y$	2	M1 for an attempt to combine terms in x **or** terms in y correctly eg $5x + x(= 6x)$, $4y - 7y(= -3y)$ A1 for $6x - 3y$ oe
	(b)	$7x + 14 = 7$ or $x + 2 = 1$ $7x = -7$	$x = -1$	2	M1 for correctly expanding the bracket or an attempt to divide both sides by 7 e.g. $7x + 14$ or $x + 2 = 7 \div 7$ oe A1 cao

Q24.

5MB2H_01 November 2015					
Question		**Working**	**Answer**	**Mark**	**Notes**
			$A = 9x^2 + 19x - 6$	4	B1 for one of $5x - 2$ or x found M1 for correct method to find area of one relevant rectangle. M1 for complete method to find whole area or simplified expression $9x^2 + 19x - 6$ or correct but not simplified formula A1 for correct, simplified formula $A = 9x^2 + 19x - 6$

Q25.

Question	Answer	Mark	Mark scheme	Additional guidance
(a)	Circle drawn	B2	for drawing a circle centre (0,0) and radius 13	Circle could be drawn freehand as long as it closely approximates to a circle
		(B1	for drawing a circle centre (0,0) with radius ≠ 13 or a circle of radius 13 with a centre not (0,0) or an incomplete correct circle drawn)	
(b)	$x = 7.2$, $y = 10.8$ and $x = -7.2$, $y = -10.8$	M1	for drawing the line $2y = 3x$	
		A1	for both x values correct or both y values correct or one pair of x and y values correct ft from (a) dep on B1	For both A marks accept answers in the ranges $x = 7.0$ to 7.4, $y = 10.6$ to 11.0 $x = -7.0$ to -7.4, $y = -10.6$ to -11.0
		A1	for both correct pairs of values correctly matched ft from (a) dep on B1	Accept values given as coordinates Check graph for answers