LETS THINK LEARNING SYSTEM
INTERNATIONAL SCHOOLING SYSTEM

Pearson

iLowerSecondary
MATHEMATICS

Numbers and Business Math

Course Outline

*Integers

*Fraction and Decimals

*Percentage

*Calculation skills

*Ratio and Proportion

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Questions

Q1.

Quentin, Romesh and Samir have 150 golf balls in total.

Quentin has 15 more golf balls than Romesh.

Romesh has 24 more golf balls than Samir.

How many golf balls does Samir have?

.....

(Total for question = 3 marks)

(**QU28 LMA11/01, June 2022**)

Q2.

A doctor is 21 years older than his daughter.

The doctor is also 38 years younger than his father.

The ages of the doctor, his daughter and his father add up to 158

How old is the doctor?

.....

(Total for question = 2 marks)

(**QU29 LMA11/01, Oct 2021**)

Q3.

(a) Paige takes her parents out for dinner.

Paige's dinner costs twice as much as her mother's dinner.

Her father's dinner costs $12 more than her mother's dinner.

The total cost of their dinners is $96

How much was Paige's dinner?

$ .....

(3)

(b) On the way home, Paige buys each of her parents some desserts.

She buys her father 4 doughnuts and 5 cupcakes for $12.81

She buys her mother 3 doughnuts and 4 cupcakes for $9.93

What is the cost of 1 doughnut and 1 cupcake?

Doughnut $ .....

Cupcake $ .....

(4)

(Total for question = 7 marks)

(**QU25 LMA11/01, Oct 2022**)

Q4.

Two teachers visit the same cafe to buy some cakes and some drinks.

All cakes are the same price.
All drinks are the same price.

One teacher buys 3 cakes and 2 drinks for $7.90

The other teacher buys 5 cakes and 4 drinks for $14.30

Work out the cost of one cake and the cost of one drink.

Cake = $ .....

Drink = $ .....

(Total for question = 4 marks)

(**QU34 LMA11/01, Oct 2021**)

Q5.

8 cricket bats and 6 cricket balls have a total mass of 11.36 kg.

11 cricket bats and 4 cricket balls have a total mass of 14.94 kg.

Each of the cricket bats have the same mass.

Each of the cricket balls have the same mass.

What would be the total mass of 6 cricket bats and 6 cricket balls?

..... kg

(Total for question = 4 marks)

(**QU33 LMA11/01, June 2022**)

Q6.

A rectangle and a square have the same area.

The width of the rectangle is 7 cm shorter than the length of the rectangle.

The perimeter of the rectangle is 50 cm.

Calculate the perimeter of the square.

You must show your working.

..... cm

(Total for question = 4 marks)

(**QU31 LMA11/01, June 2023**)

Q7.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Make ƒ the subject of the formula

$$e = 7 (f - 3)$$

$f = \frac{e - 21}{7}$ ☐ $f = \frac{e - 3}{7}$ ☐ $f = \frac{e + 3}{7}$ ☐ $f = \frac{e + 21}{7}$ ☐

(Total for question = 1 mark)

(**QU13 LMA11/01, June 2023**)

Q8.

(a) Find two pairs of values that satisfy the equation

$$4x + 5y = 46$$

x = ... y = ...

x = ... y = ...

(2)

(b) What is the next term in the sequence

48, 44.5, 39, 31.5, 22, ...

.....

(1)

(c) Expand and simplify

$$(x + 4)(x - 11)$$

.....

(2)

(Total for question = 5 marks)

(**QU17 LMA11/01, June 2023**)

Q9.

(a) Expand and fully simplify

$$3(4h + 5) + 2h(6h - 7)$$

.....

(2)

(b) Solve

$$2m + 5 = 6m - 4$$

m = ...

(2)

(Total for question = 4 marks)

(**QU25 LMA11/01, June 2019**)

Q10.

Expand and simplify

(a) $-2m\,(5m - 8)$

.....

(2)

(b) $(y + 3)\,(y - 6)$

.....

(2)

(Total for question = 4 marks)

(**QU25 LMA11/01, Oct 2023**)

Q11.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Expand and simplify $(x + 6)(x - 2)$

$x^2 + 4x - 12$	$x^2 - 12$	$x^2 - 8x - 12$	$x^2 + 8x + 12$
☐	☐	☐	☐
A	**B**	**C**	**D**

(Total for question = 1 mark)

(**QU14 LMA11/01, SAM 0**)

Q12.

(a) Expand and simplify

$(m - 3)\,(m - 7)$

.....

(2)

(b) Factorise fully

$$24a^3 - 16a^2b$$

.....

(2)

(c) Simplify fully

$$\frac{32x^3}{8x^4}$$

.....

(2)

(Total for question = 6 marks)

(**QU22 LMA11/01, Oct 2020**)

Q13.

(a) Expand and simplify

$$20w - 3w\,(4w + 5)$$

.....

(2)

(b) Solve the equation

$$\frac{7x-11}{5} = 9$$

x = ...

(2)

(c) Solve the inequality

$$9y - 11 < 5y + 10$$

.....

(2)

(Total for question = 6 marks)

(**QU22 LMA11/01, Oct 2021**)

Q14.

(a) Expand and simplify

$$9k + 14 - 4\,(3k - 6)$$

.....

(2)

(b) Expand and simplify

$$(w + 4)\,(w - 5)$$

.....

(2)

(c) Make q the subject of

$$p = \sqrt{\frac{7q}{5}}$$

.....

(3)

(d) Solve

$$\frac{7x + 1}{5} = 2x + 5$$

.....

(3)

(e) Write in its simplest form

$$y^0$$

.....

(1)

(f) Write in its simplest form

$$\frac{z^4 \times z^3}{z^2}$$

.....

(2)

(Total for question = 13 marks)

(**QU19 LMA11/01, June 2021**)

Q15.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Factorise

$$x^2 - 7x + 6$$

$(x - 1)(x - 6)$ ☐ $(x + 1)(x + 6)$ ☐ $(x - 1)(x + 6)$ ☐ $(x + 1)(x - 6)$ ☐

(Total for question = 1 mark)

(**QU13 LMA11/01, Oct 2022**)

Q16.

(a) Factorise fully

$$40xy^2 - 16y^4$$

.....

(2)

(b) Find the value of n given that

$$\frac{x^9 \times x^n}{x^2} = x^3$$

n = ...

(2)

(Total for question = 4 marks)

(**QU26 LMA11/01, June 2023**)

Q17.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Factorise $x^2 - 64$

$x(x-8)$	$(x-8)^2$	$(x-8)(x+8)$	$x(x-64)$
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU07 LMA11/01, June 2019**)

Q18.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Factorise

$$x^2 - 10x + 24$$

$(x - 2)(x + 12)$ ☐ $(x + 2)(x - 12)$ ☐ $(x - 4)(x - 6)$ ☐ $(x - 4)(x + 6)$ ☐

(Total for question = 1 mark)

(**QU13 LMA11/01, June 2022**)

Q19.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Find a solution to the equation

$$x^2 - 34 = 290$$

16 ☐ 18 ☐ 128 ☐ 162 ☐

(Total for question = 1 mark)

(**QU14 LMA11/01, Oct 2022**)

Q20.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

y is directly proportional to x.

$y = 48$ when $x = 16$

Find an expression for y in terms of x.

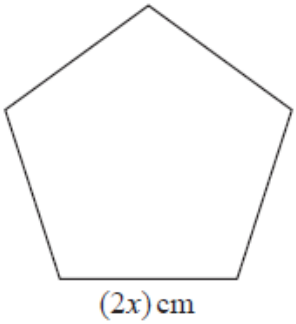
$y = 3x$ ☒ $y = 2x + 16$ ☒ $x = 3y$ ☒ $x = y - 32$ ☒

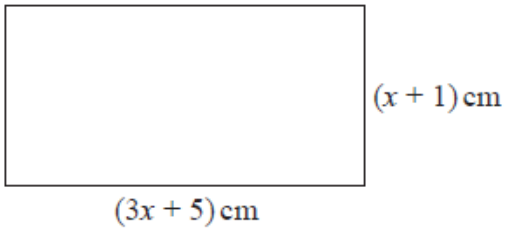
(Total for question = 1 mark)

(**QU15 LMA11/01, Oct 2020**)

Q21.

The perimeters of the regular pentagon and the rectangle below are equal.





Find the area of the rectangle.

..... cm^2

(Total for question = 4 marks)

(**QU32 LMA11/01, Oct 2020**)

Q22.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Find the value of

$$\frac{5p + \sqrt{4q}}{(6r + 5)^2}$$

when $p = 8$, $q = 9$ and $r = -1$

–58	–46	46	58
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU14 LMA11/01, Oct 2020**)

Q23.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If $a = 3$, $b = 1$ and $c = 5$, find the value of

$$(4a + 3b)^2 + ac^2$$

228	300	378	450
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU10 LMA11/01, Oct 2021**)

Q24.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If $a = 5$ and $b = –2$, find the value of

$$(a + b)^2 - \sqrt{20a} + ab$$

−11	9	29	49
☒	☒	☒	☒

(Total for question = 1 mark)

(**QU11 LMA11/01, Oct 2023**)

Q25.

If $3y = 2x + 1$, find the value of x when $y = 7$

x = ...

(Total for question = 2 marks)

(**QU16 LMA11/01, June 2019**)

Q26.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Fully simplify

$$6p - 3q + 4p + 9q$$

$10p + 6q$	$2p - 12q$	$2p + 6q$	$10p - 12q$
☒	☒	☒	☒

(Total for question = 1 mark)

(**QU01 LMA11/01, Oct 2022**)

Q27.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

y is directly proportional to x

Given $x = 30$ when $y = 20$, find the value of y when $x = 75$

50	65	85	112.5
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU15 LMA11/01, June 2023**)

Q28.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

A telephone company uses this formula to calculate how much a customer must pay

$$T = 0.25p + 0.2n + 15$$

where
T is the total cost (in $)
p is the number of minutes on calls during peak times
n is the number of minutes on calls during non-peak times

A customer spends 60 minutes on calls during non-peak times.

The total cost that she must pay is $51

How many minutes did she spend on calls during peak times?

42	96	105	156
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU12 LMA11/01, June 2022**)

Q29.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Simplify $14f - 7y + 11f + 5y$

$3f - 12y$	$3f - 2y$	$25f - 12y$	$25f - 2y$
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU01 LMA11/01, June 2021**)

Q30.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Simplify

$$11b - 5c - 6b + 3c$$

$5b - 8c$	$5b - 2c$	$17b - 8c$	$17b - 2c$
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU01 LMA11/01, Oct 2021**)

Q31.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If a = -10, b = -4 and c = 3, find the value of

$$a + (3b + c)^2$$

−91	−13	71	215
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU12 LMA11/01, June 2021**)

Q32.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Find a solution to the equation

$$x^2 + 30 = 226$$

$x = 14$	$x = 16$	$x = 98$	$x = 128$
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU15 LMA11/01, June 2022**)

Q33.

Make k the subject of the formula

$$t = \sqrt{\frac{k}{5c}}$$

.....

(Total for question = 2 marks)

(**QU28 LMA11/01, Oct 2021**)

Q34.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Make n the subject of the formula

$$m = \frac{\sqrt{7n}}{3}$$

$n = 3\left(\frac{m}{7}\right)^2$ ☐ $n = \left(\frac{3m}{7}\right)^2$ ☐ $n = \frac{3m^2}{7}$ ☐ $n = \frac{(3m)^2}{7}$ ☐

(Total for question = 1 mark)

(**QU13 LMA11/01, Oct 2020**)

Q35.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Simplify

$8k + 4\,(2k - 3) + 6$

$10k + 7$	$10k - 6$	$16k + 3$	$16k - 6$
☒	☒	☒	☒

(Total for question = 1 mark)

(**QU03 LMA11/01, Oct 2023**)

Q36.

(a) Simplify fully

$$\frac{x^7 \times x^{-4}}{x^5}$$

.....

(2)

(b) Make t the subject of

$$r = \sqrt{\frac{7t}{8}}$$

.....

(3)

(c) Solve

$$7(k - 4) = 15 - k$$

k = ...

(3)

(Total for question = 8 marks)

(**QU27 LMA11/01, Oct 2023**)

Q37.

Simplify fully the following expression

$$\frac{2m^8}{(2m^3)^2}$$

.....

(Total for question = 2 marks)

(**QU18 LMA11/01, SAM 0**)

Q38.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Simplify fully

$$9\,(2b + 8) + 4\,(7b - 5)$$

$46b + 3$ ☐ $46b + 13$ ☐ $46b + 52$ ☐ $46b + 92$ ☐

(Total for question = 1 mark)

(**QU03 LMA11/01, June 2022**)

Q39.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Simplify the expression

$$\frac{t^6 \times (t^5)^2}{t^5}$$

t^8 ☒ t^{11} ☒ t^{12} ☒ t^{17} ☒

(Total for question = 1 mark)

(**QU03 LMA11/01, June 2019**)

Q40.

(a) Write two possible pairs of solutions to the equation

$$2x + y = 31$$

(i) $x =$ ..... $y =$ .....

(ii) $x =$ ..... $y =$ .....

(2)

(b) Write down the next term in the sequence

10.5, 12, 14.5, 18, 22.5, ...

.....

(1)

(c) Calculate

$$(\sqrt{144} + 4)^2 \div (24 - 4^2)$$

.....

(2)

(Total for question = 5 marks)

(**QU20 LMA11/01, Oct 2020**)

Q41.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Solve the simultaneous equations

$$5a + 2b = 47$$

$$3a + 4b = 45$$

$a = 11, b = 3$	$a = 6, b = 7$	$a = 9, b = 1$	$a = 7, b = 6$
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU14 LMA11/01, June 2019**)

Q42.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

If $a = -3$, $b = 0.5$ and $c = 32$, find the value of

$$(a-2)^3 - \sqrt{4bc}$$

−133	−117	117	133
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU14 LMA11/01, June 2023**)

Q43.

(a) Find an expression for the nth term of the sequence

7, 17, 27, 37, 47, ...

.....

(2)

(b) What is the value of

x^0

.....

(Total for question = 3 marks)

(**QU21 LMA11/01, Oct 2023**)

Q44.

The monthly cost, C, of using a gym is calculated using the formula:

$$C = 12V + 15P$$

and P is the number of personal training sessions.

Last month, a woman visited the gym 8 times.

Her monthly cost was $171

How many personal training sessions did she have?

.....

(Total for question = 2 marks)

(**QU20 LMA11/01, SAM 0**)

Q45.

Write 2.3535353535... as an improper fraction.

You must show all your working.

.....

(Total for question = 2 marks)

(**QU30 LMA11/01, June 2019**)

Q46.

(a) Solve

$$\frac{5x-8}{7} = \frac{3x+2}{3}$$

x = ...

(3)

(b) Solve

$$46 \leq 35 - 5x$$

.....

(2)

(c) Factorise

$$x^2 - 64$$

.....

(1)

(d) Solve

$$x^2 - 4x + 3 = 0$$

x = ...

x = ...

(3)

(Total for question = 9 marks)

(**QU27 LMA11/01, SAM 0**)

Q47.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

What is the solution of the equation $8x - 24 = 64$?

$x = 5$	$x = 8$	$x = 11$	$x = 32$
☐	☐	☐	☐
A	**B**	**C**	**D**

(Total for question = 1 mark)

(**QU02 LMA11/01, SAM 0**)

Q48.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

The value of A can be calculated using the formula

$$A = 4b - c$$

When $A = 880$ and $c = 140$, what is the value of b?

185	255	2960	4080
☐	☐	☐	☐

(Total for question = 1 mark)

(**QU07 LMA11/01, Oct 2022**)

Q49.

(a) Expand and simplify $8b + 12 - 5(b - 7)$

.....

(2)

(b) Make x the subject of the formula $y = 4x^2$

.....

(2)

(Total for question = 4 marks)

(**QU24 LMA11/01, SAM 0**)

Mark Scheme

Q1.

Question number	Working	Answer	Additional Guidance	Mark
	eg. $q = r + 15$ $r = s + 24$ $q + r + s = 150$ $(r + 15) + r + (r - 24) = 150$ $3r - 9 = 150$ $3r = 159$ $r = 53$ $s = r - 24$ $s = 53 - 24$	29	M1 for forming a correct equation with any single variable M1 for solving equation to find any variable q (=68), r (=53) or s (=29) A1	(3)

(**QU28 LMA11/01, June 2022**)

Q2.

Question number	Working	Answer	Additional guidance	Mark
	eg. $d + d + 38 + d - 21$ $3d + 17 \ (= 158)$ $3d = 141$ $d = 141 \div 3$	47	M1 for forming a correct expression A1	**(2)**

(**QU29 LMA11/01, Oct 2021**)

Q3.

Question number	Working	Answer	Additional Guidance	Mark
a	$m + 2m + m + 12 = 96$ $4m + 12 =$ $96\ 4m =$ $84\ m = 21$	42	M1 for forming a correct equation M1 for solving their linear equation OR for finding the cost of her mother's dinner A1	3

Question number	Working	Answer	Additional Guidance	Mark
b	4d + 5c = 12.81 3d + 4c = 9.93 12d + 15c = 38.43 12d + 16c = 39.72 c = 1.29 3d + (4 × 1.29) = 9.93 3d + 5.16 = 9.93 3d = 4.77 d = 1.59	d = $1.59 c = $1.29	M1 correctly eliminating one variable M1 correct cost of either d or c M1 correct substitution or complete restart to find second variable A1	4

(**QU25 LMA11/01, Oct 2022**)

Q4.

Question number	Working	Answer	Additional guidance	Mark
	3c + 2d = 7.90 5c + 4d = 14.30 6c + 4d = 15.80 5c + 4d = 14.30 c = 1.50 3 × 1.50 + 2d = 7.90 4.50 + 2d = 7.90 2d = 3.40 d = 1.70	1.5(0) 1.7(0)	M1 for forming two appropriate simultaneous equations M1 for correct method to eliminate one variable M1 correct method to find the other variable A1	**(4)**

(**QU34 LMA11/01, Oct 2021**)

Q5.

Question number	Working	Answer	Additional Guidance	Mark
	eg. $8c + 6b = 11.36$ $11c + 4b = 14.94$ $16c + 12b = 22.72$ $33c + 12b = 44.82$ $17c = 22.1$ $c = 1.3$ $(8 \times 1.3) + 6b = 11.36$ $6b = 0.96$ $b = 0.16$ $(6 \times 1.3) + (6 \times 0.16)$	8.76	M1 for correctly forming equations that would allow elimination of one variable M1 for solving for one variable M1 for solving for both variables A1	(4)

(**QU33 LMA11/01, June 2022**)

Q6.

Question number	Working	Answer	Additional Guidance	Mark
	eg. $x + x + (x - 7) + (x - 7) = 50$ $4x - 14 = 50$ $x = 16,\ x - 7 = 9$ $A = 9 \times 16\ (= 144)$ $\sqrt{144} = 12$ 4×12	48	M1 forms a correct linear equation to find length or width A1 for finding the length and width of the rectangle M1 (dep on M1 from above) for correct method to find the area of each shape A1	4

(**QU31 LMA11/01, June 2023**)

Q7.

Question number	Answer	Mark
	A – expands bracket but subtracts instead of adding B – doesn't expand bracket and subtracts instead of adding C – doesn't expand bracket D – CORRECT ANSWER	1

(**QU13 LMA11/01, June 2023**)

Q8.

Question number	Working	Answer	Additional Guidance	Mark
a	eg. $x = 11.5, y = 0$ $x = 0, \quad y = 9.2$ $x = 4, \quad y = 6$ $x = 9, \quad y = 2$ $x = 5.75, y = 4.6$ etc.	Any two pairs of correct values	B2 for two correct pairs (B1 for 1 correct pair)	2

Question number	Working	Answer	Additional Guidance	Mark
b		10.5	B1	1

Question number	Working	Answer	Additional Guidance	Mark
c	$x^2 - 11x + 4x - 44$	$x^2 - 7x - 44$	M1 for 3 correct terms OR for 4 correct terms (ignoring signs) OR for $x^2 - 7x - \ldots$ OR for $\ldots - 7x - 44$ A1	2

(**QU17 LMA11/01, June 2023**)

Q9.

Question number	Working	Answer	Additional guidance	Mark
(a)	$12h + 15 + 12h^2 - 14h$	$12h^2 - 2h + 15$	M1 for three out of four including correct signs OR four without correct signs A1	(2)

Question number	Working	Answer	Additional guidance	Mark
(b)	$4 + 5 = 6m - 2m$ $9 = 4m$	2.25 oe	M1 for correctly isolating number and letter terms A1	(2)

(**QU25 LMA11/01, June 2019**)

Q10.

Question number	Working	Answer	Additional Guidance	Mark
a		$16m - 10m^2$	M1 for $16m$ OR $-10m^2$ A1 accept $-10m^2 + 16m$	2

Question number	Working	Answer	Additional Guidance	Mark
b	$y^2 - 6y + 3y - 18$	$y^2 - 3y - 18$	M1 for 3 correct terms OR for 4 correct terms (ignoring signs) OR for $y^2 - 3y - ...$ OR for $... - 3y - 18$ A1	2

(**QU25 LMA11/01, Oct 2023**)

Q11.

Question number	Answer	Marks
	A $x^2 + 4x - 12$	(1)

(**QU14 LMA11/01, SAM 0**)

Q12.

Question number	Working	Answer	Additional guidance	Mark
a	$m^2 - 3m - 7m + 21$	$m^2 - 10m + 21$	B2 for correct answer (B1 otherwise for three correct terms with correct sign, or all four correct terms regardless of signs)	(2)

Question number	Working	Answer	Additional guidance	Mark
b		$8a^2(3a - 2b)$ oe	B2 for correct answer (B1 otherwise for correct HCF taken out, or for correctly factorising by another factor involving number AND letter)	(2)

Question number	Working	Answer	Additional guidance	Mark
c	$4x^{-1}$	$\frac{4}{x}$ oe	M1 for x^{-1} or $\frac{1}{x}$ A1 accept $4x^{-1}$	(2)

(**QU22 LMA11/01, Oct 2020**)

Q13.

Question number	Working	Answer	Additional guidance	Mark
a	$20w - 12w^2 - 15w$	$5w - 12w^2$	M1 for expanding bracket correctly A1	(2)

Question number	Working	Answer	Additional guidance	Mark
b	$7x - 11 = 9 \times 5$ $7x = 45 + 11$ $x = 56 \div 7$	8	M1 for complete correct method A1	(2)

Question number	Working	Answer	Additional guidance	Mark
c	$9y - 11 < 5y + 10$ $9y - 5y < 10 + 11$ $4y < 21$	$y < 5.25$	M1 for 5.25 or correctly isolating letter and number terms A1	(2)

(**QU22 LMA11/01, Oct 2021**)

Q14.

Question number	Working	Answer	Additional guidance	Mark
a	$9k + 14 - 4\,(3k - 6)$ $9k + 14 - 12k + 24$ $-3k + 38$	$38 - 3k$	M1 for correct expansion with correct signs A1	(2)

Question number	Working	Answer	Additional guidance	Mark
b	$(w + 4)\,(w - 5)$ $w^2 + 4w - 5w - 20$	$w^2 - w - 20$	M1 for three correct terms out of four terms with correct signs, or four correct terms regardless of signs A1	(2)

Question number	Working	Answer	Additional guidance	Mark
c	$p^2 = \frac{7q}{5}$ $5p^2 = 7q$	$q = \frac{5p^2}{7}$	M1 for correctly squaring both sides M1 (dep) for multiplying both sides by 5 A1	(3)

Question number	Working	Answer	Additional guidance	Mark
d	$7x + 1 = 5(2x + 5)$ $7x + 1 = 10x + 25$ $-25 + 1 = 10x - 7x$ $-24 = 3x$	$x = -8$	M1 for multiplying both sides by 5 correctly M1 (dep) for correctly isolating letter and number terms on each side A1	(3)

Question number	Working	Answer	Additional guidance	Mark
e		1	B1	(1)

Question number	Working	Answer	Additional guidance	Mark
f	$\frac{z^7}{z^2}$	z^5	M1 for any correct first step to simplify using index laws A1	(2)

(**QU19 LMA11/01, June 2021**)

Q15.

Question number	Answer	Mark
	A – CORRECT ANSWER B – Incorrect sign on both 1 and 6 C – Incorrect sign on the 1 D – Incorrect sign on the 6	1

(**QU13 LMA11/01, Oct 2022**)

Q16.

Question number	Working	Answer	Additional Guidance	Mark
a		$8y^2(5x - 2y^2)$	B2 fully correct (B1 for a correct partial factorisation with at least two elements outside the bracket eg. $4y(10xy - 4y^3)$ etc. OR the fully correct factor $(8y^2)$ outside the bracket with a two-term expression inside the bracket)	2

Question number	Working	Answer	Additional Guidance	Mark
b	eg. $x^9 \times x^n = x^5$	-4	M1 for any correct first step to simplify using index laws A1 accept x^{-4}	2

(**QU26 LMA11/01, June 2023**)

Q17.

Question number	Answer	Mark
	C - $(x - 8)(x + 8)$	**(1)**

(**QU07 LMA11/01, June 2019**)

Q18.

Question number	Answer	Mark
	A – $(x-2)(x+12) = x^2 + 10x - 24$ B – $(x+2)(x-12) = x^2 - 10x - 24$ C – CORRECT ANSWER D – $(x-4)(x+6) = x^2 + 2x - 24$	(1)

(**QU13 LMA11/01, June 2022**)

Q19.

Question number	Answer	Mark
	A – Subtracts 34 then square roots B – CORRECT ANSWER C – Subtracts 34 and then halves D – Adds 34 but then halves	1

(**QU14 LMA11/01, Oct 2022**)

Q20.

Question number	Answer	Mark
	A - $y = 3x$	**(1)**

(**QU15 LMA11/01, Oct 2020**)

Q21.

Question number	Working	Answer	Additional guidance	Mark
	$5 \times 2x = 10x$ $3x+5 + x+1 + 3x+5 + x+1 = 8x + 12$ $10x = 8x + 12$ $10x - 8x = 12$ $2x = 12$ $x = 6$ $(3 \times 6) + 5 = 23$ $6 + 1 = 7$ 23×7	161	M1 correct expression for at least one perimeter M1(dep) forms an equation with their perimeters M1 $x = 6$ A1	**(4)**

(**QU32 LMA11/01, Oct 2020**)

Q22.

Question number	Answer	Mark
	C - 46	**(1)**

(**QU14 LMA11/01, Oct 2020**)

Q23.

Question number	Answer	Mark
	B - 300	**(1)**

(**QU10 LMA11/01, Oct 2021**)

Q24.

Question number	Answer	Mark
	A – CORRECT ANSWER B – 3^2 - √100 + 10 C – 7^2 - √100 + -10 D – 7^2 - √100 + 10	1

(**QU11 LMA11/01, Oct 2023**)

Q25.

Question number	Working	Answer	Additional guidance	Mark
	$21 = 2x + 1$ $20 = 2x$	10	M1 for 21=2x+1 oe A1	(2)

(**QU16 LMA11/01, June 2019**)

Q26.

Question number	Answer	Mark
	A – CORRECT ANSWER B – Subtracts terms in p and q C – Subtracts terms in p D – Subtracts terms in q	1

(**QU01 LMA11/01, Oct 2022**)

Q27.

Question number	Answer	Mark
	A – CORRECT ANSWER B – 75 - (30 – 20) C – 75 + (30 – 20) D – 75 × (30 ÷ 20)	1

(QU15 LMA11/01, June 2023)

Q28.

Question number	Answer	Mark
	A – substitutes 60 into both p and n then adds the 15 to find 'T' B – CORRECT ANSWER C – substitutes 60 into p then solves to find 'n' D – substitutes 60 into n then solves but without using the 15	(1)

(QU12 LMA11/01, June 2022)

Q29.

Question number	Answer	Mark
	A is not the correct answer because they have subtracted 11f and 5y B is not the correct answer because they have subtracted 11f C is not the correct answer because they have subtracted 5y **The only correct answer is D - $25f - 2y$**	**(1)**

(QU01 LMA11/01, June 2021)

Q30.

Question number	Answer	Mark
	B - $5b - 2c$	**(1)**

(**QU01 LMA11/01, Oct 2021**)

Q31.

Question number	Answer	Mark
	A is not the correct answer because they have subtracted $(3b+c)^2$ B is not the correct answer because square rooted and subtracted **The only correct answer is C - 71** D is not the correct answer because substituted 4 not -4	**(1)**

(**QU12 LMA11/01, June 2021**)

Q32.

Question number	Answer	Mark
	A – CORRECT ANSWER B – adds the 30 then square roots C – subtracts the 30 but then halves D – adds the 30 then halves	(1)

(**QU15 LMA11/01, June 2022**)

Q33.

Question number	Working	Answer	Additional guidance	Mark
	$t^2 = \frac{k}{5c}$ $5ct^2 = k$	$k = 5ct^2$	M1 for squaring both sides as the first step A1	**(2)**

(**QU28 LMA11/01, Oct 2021**)

Q34.

Question number	Answer	Mark
	D - $\frac{(3m)^2}{7}$	**(1)**

(**QU13 LMA11/01, Oct 2020**)

Q35.

Question number	Answer	Mark
	A – 8k + 2k + 4– 3 + 6 B – 8k + 2k – 12 + 6 C – 8k + 8k – 3 + 6 D – CORRECT ANSWER	1

(**QU03 LMA11/01, Oct 2023**)

Q36.

Question number	Working	Answer	Additional Guidance	Mark
a		x^{-2}	M1 for any correct first step to simplify using index laws A1 accept $1 / x^2$	2

Question number	Working	Answer	Additional Guidance	Mark
b		$t = 8r^2 / 7$	M1 for squaring as a first step M1 (dep) for multiplying by 8 as a second step A1	3

Question number	Working	Answer	Additional Guidance	Mark
c	$7(k-4) = 15-k$ $7k-28 = 15-k$ $7k+k = 15+28$ $8k = 43$ $k = 43/8$	5.375 oe	M1 for correct expansion of brackets M1 (dep) for complete method to isolate terms in k A1 accept an answer of 43/8 or 5 3/8	3

(QU27 LMA11/01, Oct 2023)

Q37.

Question number	Working	Answer	Notes	Marks
		$\frac{1}{2}m^2$	M1 for any correct simplification using index rules, e.g. $\frac{2m^8}{4m^6}$ A1	(2)

(QU18 LMA11/01, SAM 0)

Q38.

Question number	Answer	Mark
	A – fails to multiply second term in each bracket B – fails to multiply second term in each bracket and then adds C – CORRECT ANSWERS D – expands brackets correctly but then adds	(1)

(**QU03 LMA11/01, June 2022**)

Q39.

Question number	Answer	Mark
	B - t^{11}	**(1)**

(**QU03 LMA11/01, June 2019**)

Q40.

Question number	Working	Answer	Additional guidance	Mark
a	eg. x = 16, y = -1 x = 14.5, y = 2	Any two different pairs of correct values	B2 two correct pairs (B1 for one correct pair)	**(2)**

Question number	Working	Answer	Additional guidance	Mark
b		28	B1	**(1)**

Question number	Working	Answer	Additional guidance	Mark
c	$(12 + 4)^2 \div (24 - 16)$ $16^2 \div 8$ $256 \div 8$	32	M1 for one bracket correctly evaluated (256 or 8) A1	(2)

(**QU20 LMA11/01, Oct 2020**)

Q41.

Question number	Answer	Mark
	D - a = 7, b = 6	(1)

(**QU14 LMA11/01, June 2019**)

Q42.

Question number	Answer	Mark
	A – CORRECT ANSWER B – -125 + 8 (wrong sign on second term) C – 125 – 8 (wrong sign on first term) D – 125 + 8 (wrong sign on both terms)	1

(**QU14 LMA11/01, June 2023**)

Q43.

Question number	Working	Answer	Additional Guidance	Mark
a		$10n$ - 3	M1 for $10n$ A1	2

Question number	Working	Answer	Additional Guidance	Mark
b		1	B1	1

(**QU21 LMA11/01, Oct 2023**)

Q44.

Question number	Working	Answer	Notes	Marks
	$15P = 171 - 96$ $15P = 75$ $P = \frac{75}{15}$	5	M1 $96 + 15P = 171$ or better A1	**(2)**

(**QU20 LMA11/01, SAM 0**)

Q45.

Question number	Working	Answer	Additional guidance	Mark
	$x = 2.353535353535\ldots$ $100x = 235.3535353535\ldots$ $99x = 233$	$^{233}/_{99}$ oe	M1 for correctly multiplying by a power of 10 and then subtracting A1 from correct working	**(2)**

(**QU30 LMA11/01, June 2019**)

Q46.

Question number	Working	Answer	Notes	Marks
(a)	$3(5x-8)=7(3x+2)$ $15x-24=21x+14$ $-24-14=21x-15x$ oe $-38=6x$ $x=\frac{-38}{6}$ $x=\frac{-19}{3}$	$-6\frac{1}{3}$ oe	M1 $15x-24$ OR $21x+14$ M1 correctly isolate their terms in x A1	(3)

Question number	Working	Answer	Notes	Marks
(b)	$46-35 \geqslant -5x$ $11 \geqslant -5x$ $x \leqslant -\frac{11}{5}$	$x \leqslant -2.2$ oe	M1 for ± 2.2 oe A1	(2)

Question number	Working	Answer	Notes	Marks
(c)		$(x+8)(x-8)$ or $(x-8)(x+8)$	B1	(1)

Question number	Working	Answer	Notes	Marks
(d)		1 and 3	M1 $(x \pm 1)(x \pm 3)$ M1 $(x-1)(x-3)$ OR $(x-3)(x-1)$ A1	(3)

(QU27 LMA11/01, SAM 0)

Q47.

Question number	Answer	Marks
	C $x = 11$	(1)

(**QU02 LMA11/01, SAM 0**)

Q48.

Question number	Answer	Mark
	A – Subtracts 140 then divides by 4 B – CORRECT ANSWER C – Subtracts 140 then multiplies by 4 D – Adds 140 then multiplies by 4	1

(**QU07 LMA11/01, Oct 2022**)

Q49.

Question number	Working	Answer	Notes	Marks
(a)	$8b + 12 - 5b + 35$ $3b + 47$	$3b + 47$	B1 $3b$ B1 $+47$	(2)

Question number	Working	Answer	Notes	Marks
(b)	$\frac{y}{4} = x^2$ Accept $x = \sqrt{\frac{y}{4}}$	$x = (\pm)\sqrt{\frac{y}{4}}$	M1 for any one correct step shown A1 oe	(2)

(**QU24 LMA11/01, SAM 0**)