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Elite Mathematics
Pearson Edexcel International GCSE

IGCSE LINEAR · 4MA1

4MA1/2H May 2021 Worked Solutions

May 2021 paper rebuilt with the worked solution after each question.

23	2020–2026	Single-paper solutions
paper questions	52 past papers	checked by Dr Eslam



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PAST PAPER

4MA1/2H May 2021

May 2021

23	100	2 h
questions	marks	exam time

Each question is followed by its worked solution and final answer.

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Question 1

3 marks | Prime Factors, HCF & LCM

1 Write 600 as a product of powers of its prime factors.
Show your working clearly.

(Total for Question 1 is 3 marks)

WORKED SOLUTION

Question 1 · 4MA1/2H May 2021

1 Find the LCM

$$600 = 6 \times 100$$

$$600 = (2 \times 3)(2^2 \times 5^2)$$

$$600 = 2^3 \times 3 \times 5^2$$

FINAL ANSWER

$2^3 \times 3 \times 5^2$

4MA1/2H MAY 2021

Question 2

3 marks | Fractions

2 Show that $2\frac{4}{7} \div 1\frac{1}{8} = 2\frac{2}{7}$

(Total for Question 2 is 3 marks)

WORKED SOLUTION

Question 2 · 4MA1/2H May 2021

1 Simplify fraction

$$2\frac{4}{7} = \frac{18}{7}$$

$$1\frac{1}{8} = \frac{9}{8}$$

2 Divide by multiplying by the

Divide by multiplying by the reciprocal:

$$\frac{18}{7} \div \frac{9}{8} = \frac{18}{7} \times \frac{8}{9}$$

$$= \frac{16}{7} = 2\frac{2}{7}$$

FINAL ANSWER

$2\frac{2}{7}$

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Question 3

2 marks | Bearings

3 The bearing of Paris from London is 149°

Work out the bearing of London from Paris.

.....°

(Total for Question 3 is 2 marks)

WORKED SOLUTION

Question 3 · 4MA1/2H May 2021

1 Use bearings

The bearing of Paris from London is the reverse bearing of London from Paris.

2 Reverse bearings differ by

Reverse bearings differ by $180°$:

$$149° + 180° = 329°$$

FINAL ANSWER

$329°$.

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Question 4

3 marks | Set Notation & Venn Diagrams

4 $\mathscr{E}$ = {letters of the alphabet}
B = {b, r, a, z, i, l}
I = {i, r, e, l, a, n, d}

(a) List the members of the set

(i) $B \cup I$

(ii) $B \cap I'$

.....

(2)

K = {k, e, n, y, a}

Cody writes down the statement $B \cap K = \varnothing$
Cody's statement is wrong.

(b) Explain why.

.....

(1)

(Total for Question 4 is 3 marks)

WORKED SOLUTION

Question 4 · 4MA1/2H May 2021

1 Calculate value

$$B = \{b, r, a, z, i, l\}$$

$$I = \{i, r, e, l, a, n, d\}$$

2 The union contains every letter

The union contains every letter that is in B or I:

$$B \cup I = \{a, b, d, e, i, l, n, r, z\}$$

3 Calculate statistic

$B \cap I'$ means letters in B, but not in I:

$$B \cap I' = \{b, z\}$$

4 **Calculate value**

For $K = \{k, e, n, y, a\}$, Cody is not correct because the letter a is in both B and K.

$$B \cap K = \{a\}$$

✓ **FINAL ANSWER**

(a)(i) $\{a, b, d, e, i, l, n, r, z\}$, (a)(ii) $\{b, z\}$. Cody is incorrect.

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Question 5

5 marks | Angles in Polygons & Parallel Lines

5

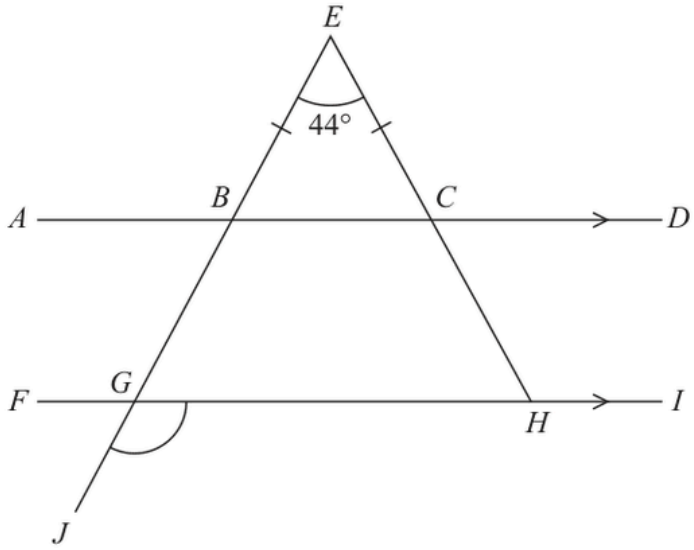


Diagram **NOT** accurately drawn

ABCD and *FGHI* are parallel straight lines.
EBGJ and *ECH* are straight lines.

$BE = CE$
Angle $BEC = 44°$

Work out the size of angle *JGH*.
Give a reason for each stage of your working.

.....°

(Total for Question 5 is 5 marks)

WORKED SOLUTION

Question 5 · 4MA1/2H May 2021

1 **Triangle is isosceles because**

Triangle EBC is isosceles because

$$BE = CE$$

2 **Find the gradient**

So the base angles are equal.

$$\angle EBC = \angle ECB = \frac{180° - 44°}{2} = 68°$$

3 **The two horizontal lines are**

The two horizontal lines are parallel, so the corresponding acute angle at G is $68°$.

4 **The required angle is supplementary**

The required angle is supplementary to this angle:

$$180° - 68° = 112°$$

✓ **FINAL ANSWER**

$112°$.

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Question 6

4 marks | Reverse Percentages

6 Mariana sells bags of bird food.

The bags that Mariana sold last week each contained 12 kg of seeds.

The bags that she is going to sell next week will each contain a mixture of nuts and seeds where for each bag

$$\text{weight of nuts} : \text{weight of seeds} = 4 : 5$$

The total weight of the nuts and the seeds in each bag will be 19.35 kg

The weight of seeds in each bag that Mariana sells next week will be less than the weight of seeds in each bag that Mariana sold last week.

Work out this decrease as a percentage of the weight of seeds in each bag that Mariana sold last week.
Give your answer correct to one decimal place.

..... %

(Total for Question 6 is 4 marks)

WORKED SOLUTION

Question 6 · 4MA1/2H May 2021

1 Split the ratio

In each new bag, the ratio

$$\text{nuts} : \text{seeds} = 4 : 5$$

2 has total parts

has 9 total parts.

3 Weight of seeds in each

Weight of seeds in each new bag:

$$\frac{5}{9} \times 19.35 = 10.75 \text{ kg}$$

4 Decrease in seed weight

Decrease in seed weight:

$$12 - 10.75 = 1.25 \text{ kg}$$

5 **Percentage decrease**

Percentage decrease:

$$\frac{1.25}{12} \times 100 = 10.416\ldots\%$$

✓ **FINAL ANSWER**

10.4%

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Question 7

3 marks | Right-Angled Triangles - Pythagoras & Trigonometry

7 Here is a right-angled triangle.

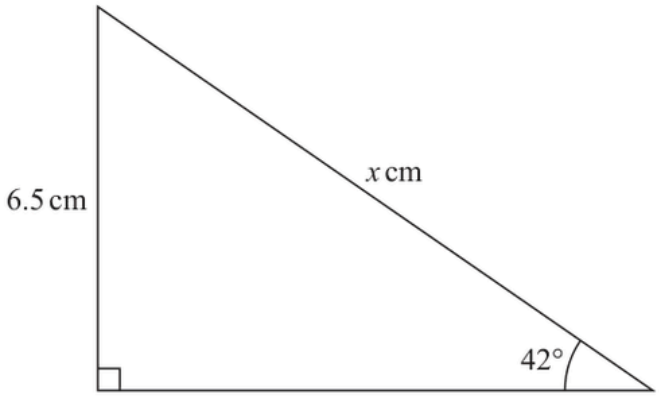


Diagram **NOT** accurately drawn

Work out the value of x.
Give your answer correct to one decimal place.

$x =$ .....

(Total for Question 7 is 3 marks)

WORKED SOLUTION

Question 7 · 4MA1/2H May 2021

1 The side cm is opposite

The side 6.5 cm is opposite the $42°$ angle and x is the hypotenuse.

$$\sin 42° = \frac{6.5}{x}$$

$$x = \frac{6.5}{\sin 42°} = 9.714\ldots$$

FINAL ANSWER

$x = 9.7$ cm.

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Question 8

3 marks | Simultaneous Equations

8 Solve the simultaneous equations

$$5a + 2c = 10$$
$$2a - 4c = 7$$

Show clear algebraic working.

$a =$ .....

$c =$ .....

(Total for Question 8 is 3 marks)

WORKED SOLUTION

Question 8 · 4MA1/2H May 2021

1 Solve simultaneous equations

$$5a + 2c = 10$$

$$2a - 4c = 7$$

2 Double the first equation

Double the first equation:

$$10a + 4c = 20$$

3 Add this to the second

Add this to the second equation:

$$12a = 27$$

$$a = \frac{9}{4}$$

4 **Solve simultaneous equations**

Substitute into $5a + 2c = 10$:

$$5\left(\frac{9}{4}\right) + 2c = 10$$

$$\frac{45}{4} + 2c = \frac{40}{4}$$

$$2c = -\frac{5}{4}$$

$$c = -\frac{5}{8}$$

✓ **FINAL ANSWER**

$a = \frac{9}{4}$, $c = -\frac{5}{8}$.

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Question 9

3 marks | Factorising

9 (i) Factorise $x^2 + 2x - 24$

.....

(2)

(ii) Hence solve $x^2 + 2x - 24 = 0$

.....

(1)

(Total for Question 9 is 3 marks)

WORKED SOLUTION

Question 9 · 4MA1/2H May 2021

1 Factorise expression

$$x^2 + 2x - 24 = (x + 6)(x - 4)$$

2 Factorise expression

So

$$(x + 6)(x - 4) = 0$$

FINAL ANSWER

$x = -6$ or $x = 4$

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Question 10

5 marks | Volume & Surface Area

10 Here is a triangular prism.

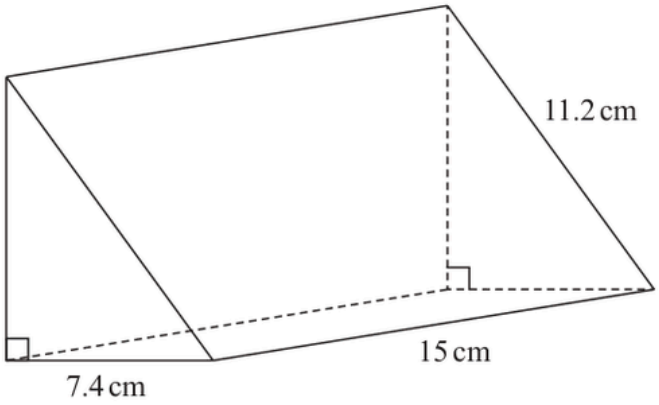


Diagram **NOT** accurately drawn

Work out the volume of the prism.
Give your answer correct to 3 significant figures.

..... cm^3

(Total for Question 10 is 5 marks)

WORKED SOLUTION

Question 10 · 4MA1/2H May 2021

1 Find the height of the

Find the height of the triangular cross-section:

$$h^2 = 11.2^2 - 7.4^2$$

$$h = 8.407\ldots$$

2 Area of the triangular cross

Area of the triangular cross-section:

$$\frac{1}{2}(7.4)(8.407\ldots) = 31.106\ldots$$

3 Volume of the prism

Volume of the prism:

$$31.106\ldots \times 15 = 466.596\ldots$$

FINAL ANSWER

$467\ \text{cm}^3$.

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Question 11

6 marks | Compound Interest & Depreciation

11 Chengbo sold a house for 180 000 yuan.

The amount for which he sold the house is 24% more than the amount he paid for the house.

(a) Work out how much Chengbo paid for the house.
Give your answer correct to 3 significant figures.

..... yuan
(3)

Zhi bought a house on 1st January 2017
When she bought the house, its value was 120 000 yuan.

The value of the house increased by 1.8% per year.

(b) Work out the value of Zhi's house on 1st January 2020
Give your answer correct to 3 significant figures.

..... yuan
(3)

(Total for Question 11 is 6 marks)

WORKED SOLUTION

Question 11 · 4MA1/2H May 2021

1 **Use compound interest**

For Chengbo's house, 180000 yuan is 124% of the price paid.

$$\text{price paid} = 180000 \div 1.24 = 145161.29\ldots$$

2 **To 3 significant figures**

To 3 significant figures:

$$145000$$

3 **Use compound interest**

For Zhi's house, the value increases by 1.8% each year for 3 years.

$$120000 \times 1.018^3 = 126598.2\ldots$$

4 **To 3 significant figures**

To 3 significant figures:

$$127000$$

✓ **FINAL ANSWER**

Chengbo paid 145000 yuan. Zhi's house was worth 127000 yuan.

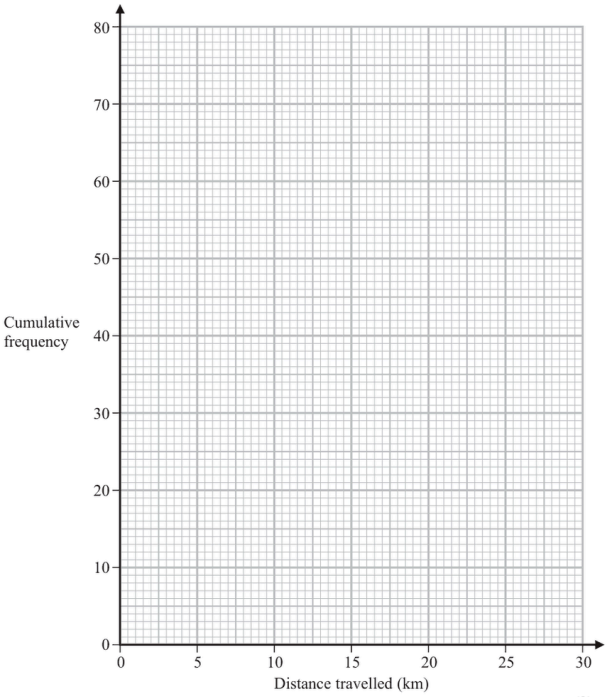
Question 12

7 marks | Cumulative Frequency Diagrams

12 The cumulative frequency table gives information about the distance, in kilometres, that each of 80 workers travel from home to work at Office *A*.

Distance travelled (d km)	Cumulative frequency
$0 < d \leqslant 5$	17
$0 < d \leqslant 10$	32
$0 < d \leqslant 15$	57
$0 < d \leqslant 20$	70
$0 < d \leqslant 25$	76
$0 < d \leqslant 30$	80

(a) On the grid below, draw a cumulative frequency graph for the information in the table.



(2)

(b) Use your graph to find an estimate for the median distance travelled.

..... km

(1)

(c) Use your graph to find an estimate for the interquartile range of the distances travelled.

..... km

(2)

For Office *B*, the median distance workers travel from home to work is 15 km and the interquartile range is 5 km.

(d) Use the information above to compare the distances that workers at Office *A* and workers at Office *B* travel from home to work.
Write down **two** comparisons.

1 .....

2 .....

.....

(2)

(Total for Question 12 is 7 marks)

1

(a) Plot the table

Plot $(5, 17), (10, 32), (15, 57), (20, 70), (25, 76), (30, 80)$, start at $(0, 0)$, and join with a smooth curve.

2

(b) Median

Read across from 40: about 11.6 km.

3

(c) Interquartile range

Lower quartile at 20: about 6 km. Upper quartile at 60: about 16.2 km.

$$\text{IQR} \approx 16.2 - 6 = 10.2 \text{ km}$$

4

(d) Two comparisons

1. Office A has a lower median (about 11.6 km against 15 km), so on average workers at Office A travel a shorter distance.
2. Office A has a larger IQR (about 10 km against 5 km), so the distances at Office A are more varied (less consistent).

✓ **FINAL ANSWER**

(b) about 11.6 km (c) about 10 km (d) A shorter on average; A more spread out

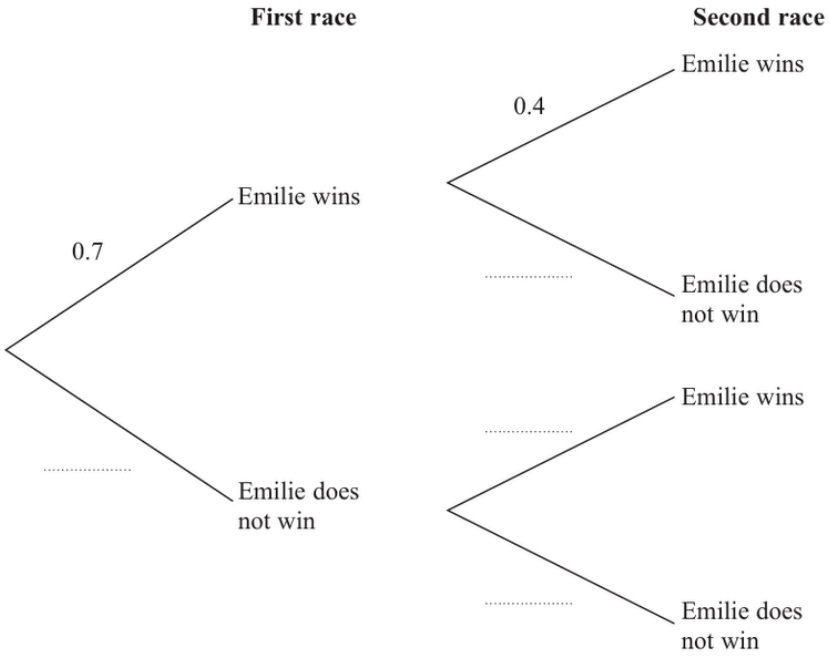
Question 13

8 marks | Tree Diagrams & Conditional Probability

13 Emilie takes part in two races.

The probability that she wins the first race is 0.7
The probability that she wins the second race is 0.4
The outcomes of the two races are independent.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Emilie wins exactly one of the two races.

.....

(3)

Emilie is going to take part in a third race.

If she wins both of the first two races, the probability that she will win the third race is 0.6

If she wins exactly one of the first two races, the probability that she will win the third race is 0.3

(c) Work out the probability that Emilie will win exactly two of the three races.

.....

(3)

(Total for Question 13 is 8 marks)

1 **(a) Complete the tree**

First race: does not win 0.3.

Second race: after a win, does not win 0.6; after not winning, wins 0.4 and does not win 0.6.

2 **(b) Exactly one win**

$$0.7 \times 0.6 + 0.3 \times 0.4 = 0.42 + 0.12 = 0.54$$

3 **(c) Win the first two, lose the third**

$P(\text{win both}) = 0.7 \times 0.4 = 0.28$, then lose the third with $1 - 0.6 = 0.4$:

$$0.28 \times 0.4 = 0.112$$

4 **(c) Exactly one of the first two, then win the third**

$$0.54 \times 0.3 = 0.162$$

5 **(c) Add the cases**

$$0.112 + 0.162 = 0.274$$

✓ **FINAL ANSWER**

(a) 0.3; 0.6; $0.4, 0.6$ (b) 0.54 (c) 0.274

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Question 14

3 marks | Algebraic Roots & Indices

14 Simplify fully $\left(\frac{9x^4}{16y^{10}}\right)^{-\frac{1}{2}}$

(Total for Question 14 is 3 marks)

WORKED SOLUTION

Question 14 · 4MA1/2H May 2021

1 Use index laws

$$\left(\frac{9x^4}{16y^{10}}\right)^{-1/2}$$

2 A negative power takes the

A negative power takes the reciprocal:

$$\left(\frac{16y^{10}}{9x^4}\right)^{1/2}$$

3 Simplify surd

Now take the square root of each factor:

$$\frac{\sqrt{16y^{10}}}{\sqrt{9x^4}} = \frac{4y^5}{3x^2}$$

FINAL ANSWER

$\frac{4y^5}{3x^2}$.

Question 15

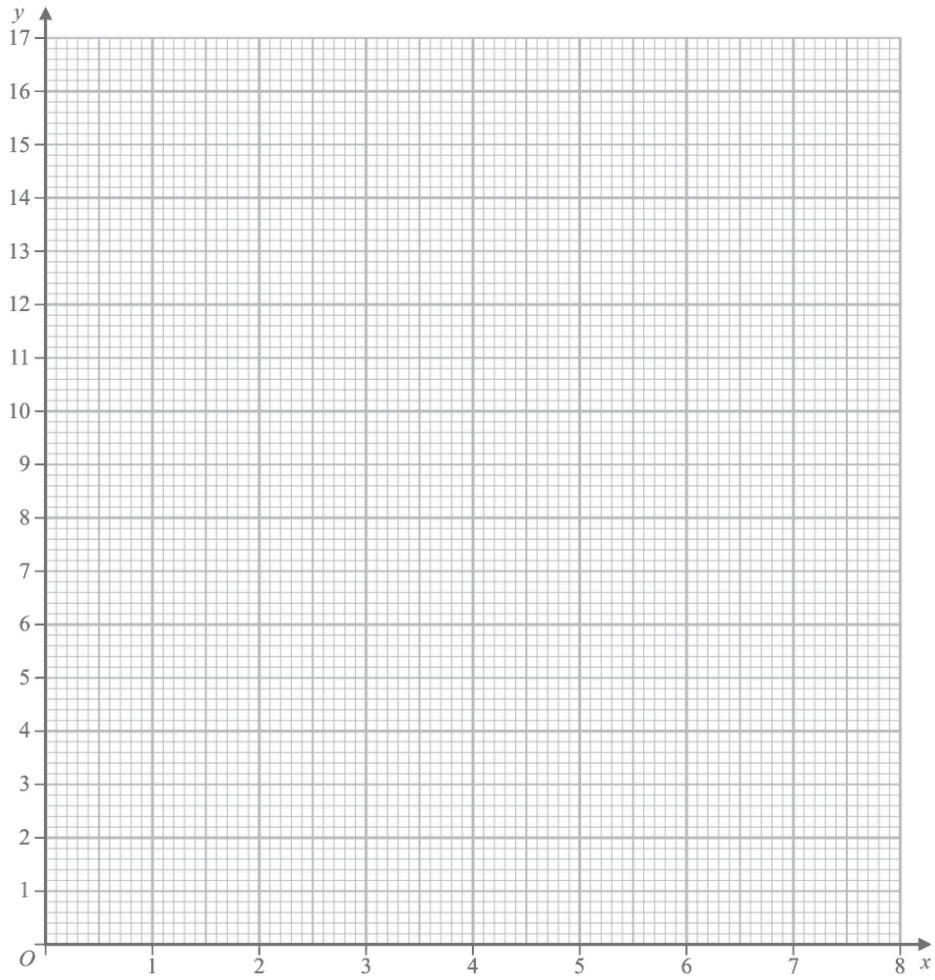
4 marks | Graphs of Functions

15 (a) Complete the table of values for $y = \frac{1}{x}(x^2 + 4)$

x	0.25	0.5	1	2	4	8
y	16.25					8.5

(2)

(b) On the grid, draw the graph of $y = \frac{1}{x}(x^2 + 4)$ for $0.25 \leqslant x \leqslant 8$



(2)

(Total for Question 15 is 4 marks)

1 Read the graph

$$y = \frac{1}{x}(x^2 + 4) = x + \frac{4}{x}$$

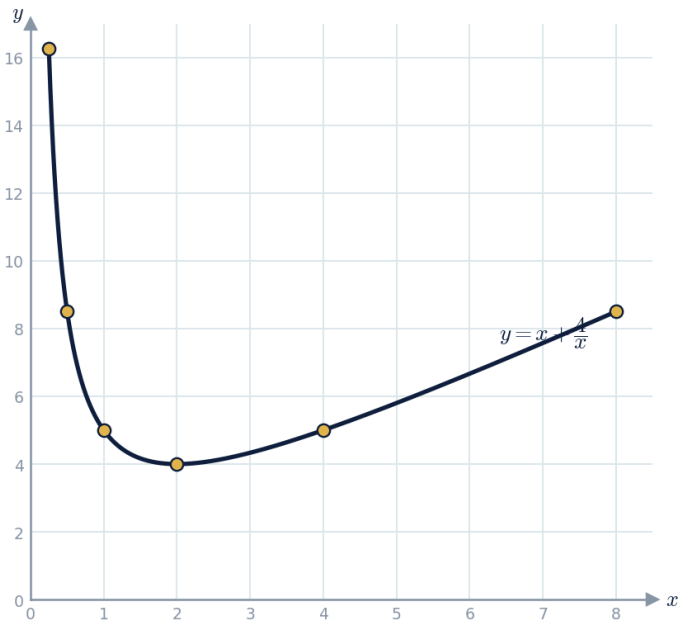
2 The completed table is

The completed table is:

x	0.25	0.5	1	2	4	8
y	16.25	8.5	5	4	5	8.5

3 Plot the points and join

Plot the points and join them with a smooth curve.



FINAL ANSWER

Missing values are $8.5, 5, 4, 5$.

Question 16

6 marks | Direct & Inverse Proportion

16 A is inversely proportional to the square of r

$A = 5$ when $r = 0.3$

(a) Find a formula for A in terms of r

.....

(3)

(b) Find the value of A when $r = 7.5A$

$A =$ .....

(3)

(Total for Question 16 is 6 marks)

1 **Find inverse function**

A is inversely proportional to r^2, so

$$A = \frac{k}{r^2}$$

2 **Use when**

Use $A = 5$ when $r = 0.3$:

$$5 = \frac{k}{0.3^2}$$

$$k = 5 \times 0.09 = 0.45$$

3 **Find inverse function**

So

$$A = \frac{0.45}{r^2}$$

4 **Rearrange formula**

For part (b), $r = 7.5A$. Substitute into the formula:

$$A = \frac{0.45}{(7.5A)^2}$$

$$A = \frac{0.45}{56.25A^2}$$

$$56.25A^3 = 0.45$$

$$A^3 = 0.008$$

$$A = 0.2$$

✓ **FINAL ANSWER**

(a) $A = \frac{0.45}{r^2}$, (b) $A = 0.2$.

Question 17

4 marks | Linear Graphs

17 The straight line **L** passes through the points (4, −1) and (6, 4)

The straight line **M** is perpendicular to **L** and intersects the y-axis at the point (0, 8)

Find the coordinates of the point where **M** intersects the x-axis.

(..... , ...)

(Total for Question 17 is 4 marks)

1 **Use Coordinate geometry tag correct**

Line L passes through $(4, -1)$ and $(6, 4)$.

2 **Its gradient is**

Its gradient is

$$\frac{4-(-1)}{6-4} = \frac{5}{2}$$

3 **Find the gradient**

Line M is perpendicular to L, so its gradient is

$$-\frac{2}{5}$$

4 **Line intersects the y axis**

Line M intersects the y-axis at $(0, 8)$, so

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

5 **Evaluate fraction**

At the x-axis, $y = 0$:

$$0 = -\frac{2}{5}x + 8$$

$$\frac{2}{5}x = 8$$

$$x = 20$$

✓ **FINAL ANSWER**

$(20, 0)$.

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Question 18

6 marks | Circle Theorems

18

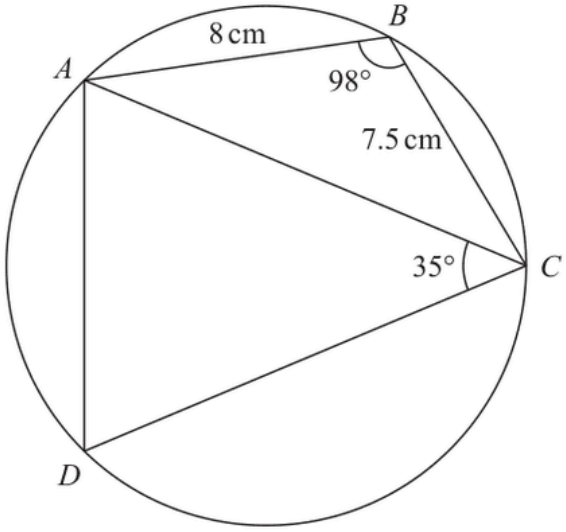


Diagram **NOT** accurately drawn

$ABCD$ is a quadrilateral where A, B, C and D are points on a circle.

$AB = 8$ cm
$BC = 7.5$ cm
Angle $ABC = 98°$
Angle $ACD = 35°$

Work out the perimeter of quadrilateral $ABCD$.
Give your answer correct to one decimal place.

..... cm

(Total for Question 18 is 6 marks)

WORKED SOLUTION

Question 18 · 4MA1/2H May 2021

1 **Use trigonometry**

In triangle ABC, use the cosine rule:

$$AC^2 = 8^2 + 7.5^2 - 2(8)(7.5)\cos 98°$$

$$AC = 11.702\ldots$$

2 **Opposite angles in a cyclic**

Opposite angles in a cyclic quadrilateral add to $180°$, so

$$\angle ADC = 180° - 98° = 82°$$

3 **Use trigonometry**

In triangle ACD,

$$\angle CAD = 180° - 82° - 35° = 63°$$

4 **Use the sine rule**

Use the sine rule:

$$AD = \frac{AC \sin 35°}{\sin 82°} = 6.778\ldots$$

$$CD = \frac{AC \sin 63°}{\sin 82°} = 10.529\ldots$$

5 **Perimeter**

Perimeter:

$$8 + 7.5 + 6.778\ldots + 10.529\ldots = 32.807\ldots$$

✓ **FINAL ANSWER**

$32.8\ \text{cm}$.

4MA1/2H MAY 2021

Question 19

5 marks | Simultaneous Equations

19 Solve the simultaneous equations

$$y = 3 - 2x$$
$$x^2 + y^2 = 18$$

Show clear algebraic working.

(Total for Question 19 is 5 marks)

WORKED SOLUTION

Question 19 · 4MA1/2H May 2021

1 **Solve simultaneous equations**

$$y = 3 - 2x$$

$$x^2 + y^2 = 18$$

2 **Substitute**

Substitute $y = 3 - 2x$:

$$x^2 + (3 - 2x)^2 = 18$$

$$x^2 + 9 - 12x + 4x^2 = 18$$

$$5x^2 - 12x - 9 = 0$$

3 **Factorise**

Factorise:

$$(5x + 3)(x - 3) = 0$$

4 **Solve simultaneous equations**

So

$$x = -\frac{3}{5} \quad \text{or} \quad x = 3$$

5 **Solve simultaneous equations**

If $x = -\frac{3}{5}$, then

$$y = 3 - 2\left(-\frac{3}{5}\right) = \frac{21}{5}$$

---

6 **Solve simultaneous equations**

If $x = 3$, then

$$y = 3 - 6 = -3$$

✓ **FINAL ANSWER**

$(x, y) = \left(-\frac{3}{5}, \frac{21}{5}\right)$ or $(3, -3)$.

4MA1/2H MAY 2021

Question 20

3 marks | Area & Volume of Similar Shapes

20 Mathematically similar wooden blocks are made in a workshop.

There are small blocks and there are large blocks.

The volume of each small block is $300\,\text{cm}^3$

Given that

the surface area of each small block : the surface area of each large block = 25 : 36

work out the volume of each large block.

..... cm^3

(Total for Question 20 is 3 marks)

WORKED SOLUTION

Question 20 · 4MA1/2H May 2021

1 Split the ratio

The surface area ratio of the small block to the large block is

$$25 : 36$$

2 Split the ratio

So the linear ratio is

$$\sqrt{25} : \sqrt{36} = 5 : 6$$

3 Split the ratio

Therefore the volume ratio is

$$5^3 : 6^3 = 125 : 216$$

4 The small block has volume

The small block has volume $300\ \text{cm}^3$.

5 Large block volume

Large block volume:

$$300 \times \frac{216}{125} = 518.4$$

FINAL ANSWER

$\boxed{518.4\ \text{cm}^3}$

4MA1/2H MAY 2021

Question 21

5 marks | Differentiation & Turning Points

21 The point A is the only stationary point on the curve with equation $y = kx^2 + \frac{16}{x}$ where k is a constant.

Given that the coordinates of A are $\left(\frac{2}{3}, a\right)$

find the value of a.
Show your working clearly.

$a =$ .....

(Total for Question 21 is 5 marks)

WORKED SOLUTION

Question 21 · 4MA1/2H May 2021

1 Evaluate fraction

$$y = kx^2 + \frac{16}{x}$$

2 Differentiate

Differentiate:

$$\frac{dy}{dx} = 2kx - \frac{16}{x^2}$$

3 Find the gradient

At the stationary point, $x = \frac{2}{3}$, so the gradient is 0:

$$2k\left(\frac{2}{3}\right) - \frac{16}{\left(\frac{2}{3}\right)^2} = 0$$

$$\frac{4k}{3} - \frac{16}{\frac{4}{9}} = 0$$

$$\frac{4k}{3} - 36 = 0$$

$$\frac{4k}{3} = 36$$

$$k = 27$$

4 Find the -coordinate

Now find a, the y-coordinate when $x = \frac{2}{3}$:

$$a = 27\left(\frac{2}{3}\right)^2 + \frac{16}{\frac{2}{3}}$$

$$a = 27 \cdot \frac{4}{9} + 24$$

$$a = 12 + 24 = 36$$

FINAL ANSWER

$a = 36$

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Question 22

4 marks | Completing the Square

22 The curve **S** has equation $y = f(x)$ where $f(x) = x^2$
The curve **T** has equation $y = g(x)$ where $g(x) = 2x^2 - 12x + 13$

By writing $g(x)$ in the form $a(x - b)^2 - c$, where a, b and c are constants, describe fully a series of transformations that map the curve **S** onto the curve **T**.

(Total for Question 22 is 4 marks)

WORKED SOLUTION

Question 22 · 4MA1/2H May 2021

1 Solve inequality

$$g(x) = 2x^2 - 12x + 13$$

$$= 2(x^2 - 6x) + 13$$

$$= 2\left((x - 3)^2 - 9\right) + 13$$

$$= 2(x - 3)^2 - 18 + 13$$

$$= 2(x - 3)^2 - 5$$

2 Calculate value

Starting with $S : y = x^2$:

3 Translate 3 units to the

- Translate 3 units to the right to get $y = (x - 3)^2$.
- Stretch parallel to the y-axis by scale factor 2 to get $y = 2(x - 3)^2$.
- Translate 5 units down to get $y = 2(x - 3)^2 - 5$.

✓ **FINAL ANSWER**

$g(x) = 2(x - 3)^2 - 5$. Transformations: right 3, stretch parallel to the y-axis by scale factor 2, then down 5.

4MA1/2H MAY 2021

Question 23

5 marks | Probability Toolkit

23 Pippa has a box containing N pens.

There are only black pens and red pens in the box.
The number of black pens in the box is 3 more than the number of red pens.

Pippa is going to take at random 2 pens from the box.

The probability that she will take a black pen **followed** by a red pen is $\frac{9}{35}$

Find the possible values of N.
Show clear algebraic working.

(Total for Question 23 is 5 marks)

WORKED SOLUTION

Question 23 · 4MA1/2H May 2021

1 Let the number of red

Let the number of red pens be r.

2 List probability cases

Then the number of black pens is

$$r + 3$$

3 Calculate value

and

$$N = 2r + 3$$

4 Evaluate fraction

So

$$r = \frac{N - 3}{2}$$

5 **Evaluate fraction**

and

$$r+3=\frac{N+3}{2}$$

6 **The probability of black followed**

The probability of black followed by red is

$$\frac{(N+3)/2}{N}\cdot\frac{(N-3)/2}{N-1}=\frac{9}{35}$$

$$\frac{N^2-9}{4N(N-1)}=\frac{9}{35}$$

$$35(N^2-9)=36N(N-1)$$

$$35N^2-315=36N^2-36N$$

$$N^2-36N+315=0$$

$$(N-15)(N-21)=0$$

✓ **FINAL ANSWER**

$N=15$ or $N=21$