Candidate surname	Other names

Maths Planner

Edexcel

2024 Predicted Paper

Mathematics

PAPER 1 (Non-Calculator)

Foundation Tier

Time 1 hour 30 minutes

WORKED WRITTEN SOLUTIONS

Total Marks

80

Q	Topic(s)	Marks
1	Converting FDP	/ 1
2	Rounding	/ 1
3	Metric Unit Conversions	/ 1
4	Simplifying Expressions	/ 2
5	Order of Operations (BIDMAS)	/ 1
6	Percentages of Amounts	/ 2
7	Factors, Multiples and Primes	/ 2
8	Solving and Rearranging Equations	/ 3
9	Probability Scales	/ 3
10	FDP with Ratio	/ 2
11	Angles in Quadrilaterals	/ 2
12	Systematic Listing Outcomes	/ 2
13	Written Calculations and Percentages	/ 6
14	Pictograms	/ 4

Q	Topic(s)	Marks
15	Function Machines	/ 3
16	Algebraic Perimeter	/ 3
17	Transformations	/ 4
18	Plans and Elevations / Circumference	/ 4
19	Estimation	/ 3
20	Ordering Fractions / Operations	/ 4
21	Area of Quadrilaterals	/ 4
22	Averages from Frequency Table	/ 4
23	Gradient and Equation of Line	/ 3
24	Calculating with Speed	/ 3
25	Product of Primes	/ 2
26	Converting Standard From	/ 2
27	Quadratic Graphs	/ 4
28	Expanding Brackets / Laws of Indices	/ 5

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in you working.

1 Write 2.5 as a fraction.

$\frac{25}{10} = \frac{5}{2}$

.....

(Total marks for Question 1 is 1 mark)

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2 Round 945 670 to 2 significant figures.

950,000

.....

(Total marks for Question 2 is 1 mark)

---

3 Convert 0.28 kg to grams.

1 kg = 1000g (x1000)

$0.28 \times 1000 = 280$

280 ..... grams

(Total marks for Question 3 is 1 mark)

---

4 Fully simplify expressions

(a) $x \times x \times x \times 2$

x^3

$2x^3$

.....

(1)

(b) $-2e + 7e - e$

$4e$

.....

(1)

(Total marks for Question 4 is 2 marks)

---

5 Work out $\sqrt{64} + (-2)^2$ $= 8 + 4$

$(-2)^2 = -2 \times -2 = 4$ $= 12$

$\sqrt{64} = 8$

12

.....

(Total marks for Question 5 is 1 mark)

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6 Find 30% of 2.5 hours.

2.5 hours = 120 + 30
= 150 mins

10% = 15
30% = 45

45mins (0.75 hr)

(Total marks for Question 6 is 2 marks)

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7 Here is a list of numbers.

2 24 21 9 48 18 27 3

(a) Write down all the prime numbers in the list.

2, 3

(1)

(b) From the numbers in the list, write down a multiple of **both** 6 and 9

6, 12, 18, 24, ...
9, 18, 27, 36, ...

18

(1)

(Total marks for Question 7 is 2 marks)

---

8 (a) Solve $3a - 7 = 8$

$3a - 7 = 8$

$3a = 15$

$a = 5$

$a =$ 5

(2)

(b) Make x the subject of $\frac{x}{y} = 3$

$x = 3xy$

$x = 3y$

(1)

(Total marks for Question 8 is 3 marks)

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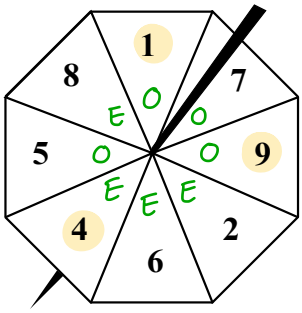
9 Here is a fair 8-sided spinner and dice.

$1^2 = 1$

$2^2 = 4$

$3^2 = 9$

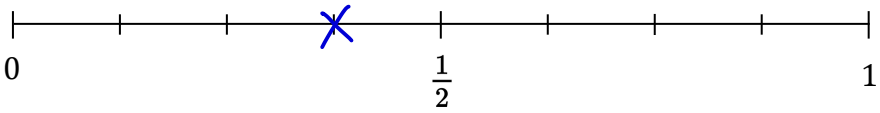


Spinner

Dice

(a) On the probability scale, mark with a cross (X) the probability of the spinner landing on a square number. = 3/8

(1)



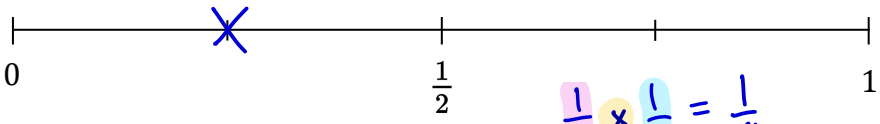
(b) On the probability scale, mark with a cross (X) the probability of the spinner landing on an even number **AND** the dice landing on an odd.

(2)

"AND" (X)

P(Even) = 4/8 = 1/2

P(odd) = 3/6 = 1/2



1/2 x 1/2 = 1/4

(Total marks for Question 9 is 3 marks)

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10 In a bag there are red, blue and green counters in the ratio 8 : 5 : 7

What percentage of the bag is green?

100%

R : B : G	total
8 : 5 : 7	20
40 : 25 : 35	100%

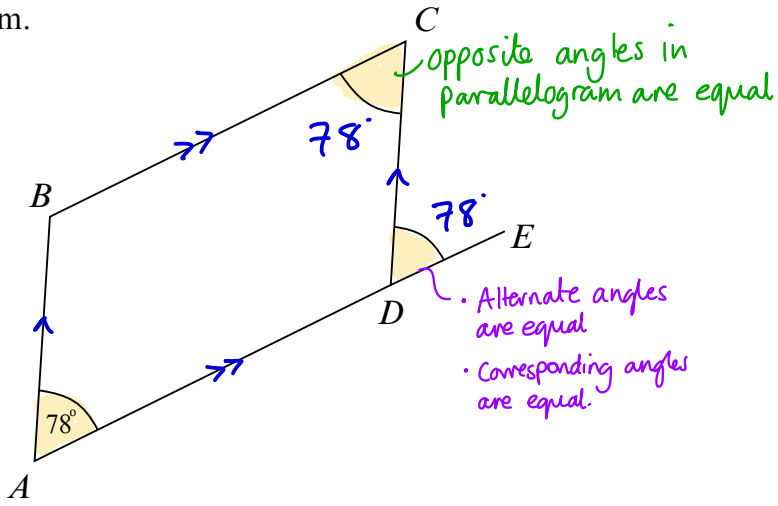
(×5 from 8 : 5 : 7 to 40 : 25 : 35; ×5 from 20 to 100%)

35 ..... %

(Total marks for Question 10 is 2 marks)

1F24

11 $ABCD$ is a parallelogram.
ADE is a straight line.



(a) Find the size of angle BCD.

$BCD =$ 78° .....
(1)

(b) Find the size of angle CDE.

$CDE =$ 78° .....
(1)

(Total marks for Question 11 is 2 marks)

---

12 Two games are played.
In each game you can either Win, Draw or Lose.
List all the possible outcomes of results from playing the two games.

Game 1: W, D, L
Game 2: W, D, L

combinations = 3×3 = 9

(W,W) (W,D) (W,L)
(D,W) (D,D) (D,L)
(L,W) (L,D) (L,L)

(Total marks for Question 12 is 2 marks)

---

13 Felix is buying a new smart phone.
A phone shop is offering the following contract deal.

24 − 9 = 15

Smart phone	£978	one-time payment
Sim (unlimited calls / data)	£13	per month for the first 9 months, then £19 per month there after.

(a) Felix signs a 2 year contract. 24 months
The cost of the smart phone is evenly split across the 2 years.
Work out how much they will spend over the entire duration of the contract.

First 9 months = £117

13 × 9 = 117

Remaining 15 months = £285

15 × 19 = 285

Total contract = 978 + 117 + 285
= £1380

978 + 117 + 285 = 1380

£ 1380
(3)

(b) After one year, Felix's phone company offers them a deal to pay off what they still owe on the contract with a 25% discount.
Calculate how much money Felix will save if they accept this offer.

12 months remaining

Phone cost = $\frac{978}{2}$ = £489

978 ÷ 2 = 489

Sim cost = 19 × 12 = £228

Remaining contract
= 489 + 228
= £717

25% = 717.00 ÷ 4 = 179.25

£ 179.25
(3)

(Total marks for Question 13 is 6 marks)

14 The incomplete pictogram shows information about the number movie genres tickets sold at a cinema on a Friday night.

Action	24 24 12	60
Animation	24 12	36
Romance	24 6	30
Horror	18	18

Key:

represents 24 tickets

= 12

= 6

(a) How many Romance movie tickets were sold?

24 + 6 = 30

30

(1)

A total of 144 tickets were sold.

Twice as many Animation movie tickets were sold compared to Horror movie tickets.

(b) Complete the pictogram.

60 + 30 = 90

144 − 90 = 54

A : H total

2 : 1 3) x 18

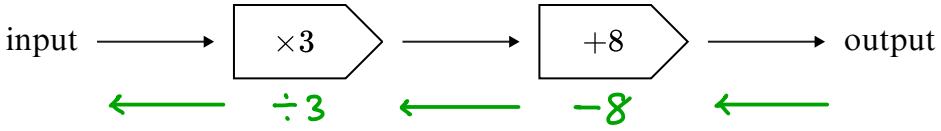
x18 (

36 : 18 54

(3)

(Total marks for Question 14 is 4 marks)

15 The diagram shows a number machine.



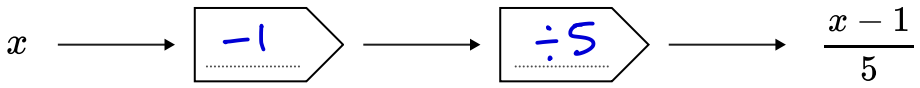
(a) Work out the input when the output is -13

$-13-8=-21$ $\quad \frac{-21}{3}=-7$ $\quad -7$

.....

(1)

Here is a function machine.



(b) Complete the function machine. (2)

(Total marks for Question 15 is 3 marks)

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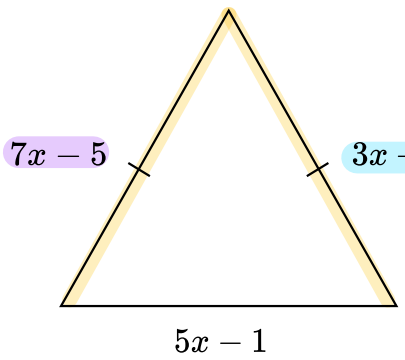
16 Here is an isosceles triangle with centimetre lengths.



$= 7(3)-5$
$= 21-5$
$= 16\text{ cm}$

$= 3(3)+7$
$= 9+7$
$= 16\text{cm}$

Work out the value of its perimeter.

$7x-5 = 3x+7$

$4x-5 = 7$

$4x = 12$

$x = 3$

$5(3)-1 = 15-1$
$= 14\text{cm}$

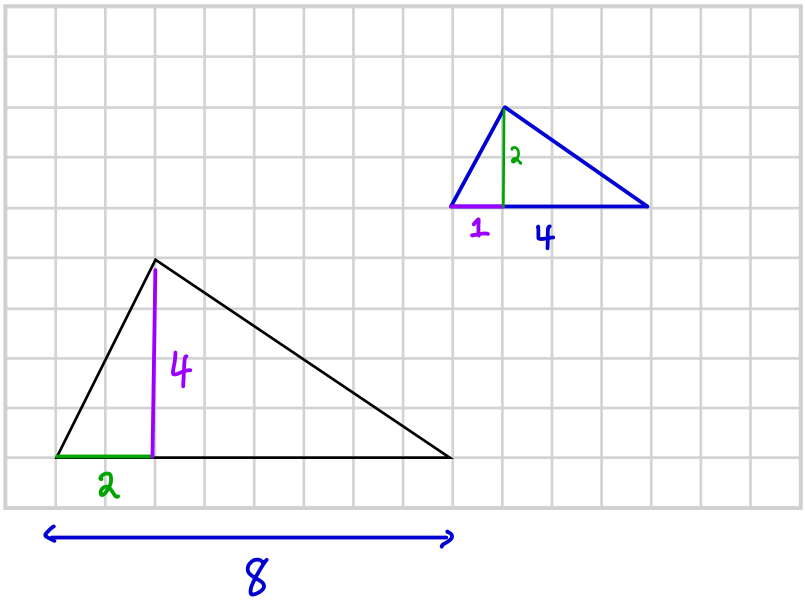
Perimeter $= 16+16+14$
$= 46\text{cm}$

46 cm

.....

(Total marks for Question 16 is 3 marks)

17 (a) On the grid, draw an enlargement of the shape with a scale factor of $\frac{1}{2}$



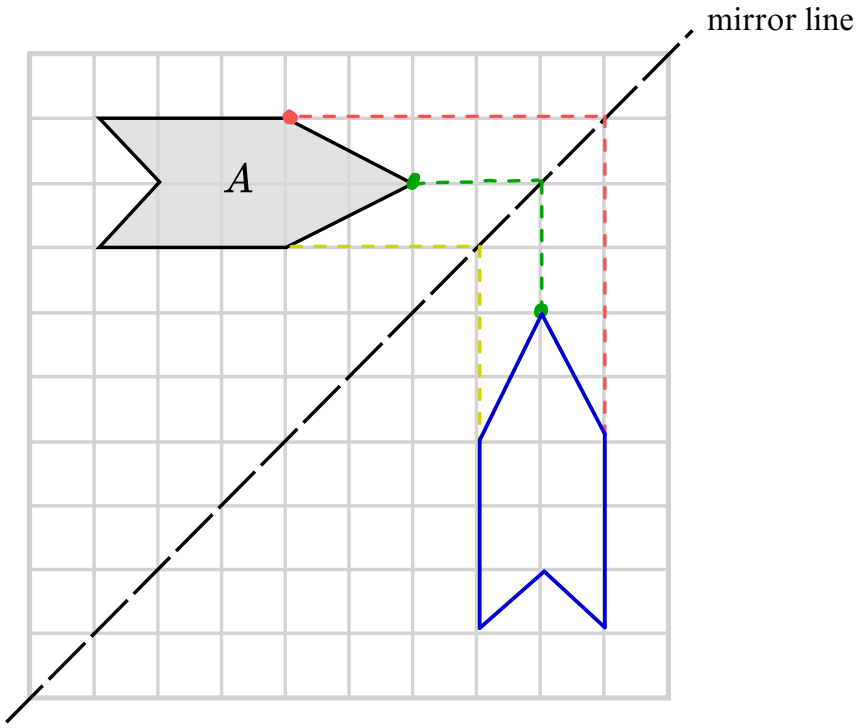
$8 \times \frac{1}{2} = 4$

$2 \times \frac{1}{2} = 1$

$4 \times \frac{1}{2} = 2$

(2)

(b) Reflect shape **A** in the mirror line.



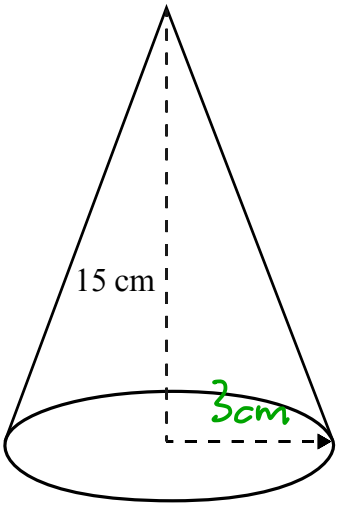
(2)

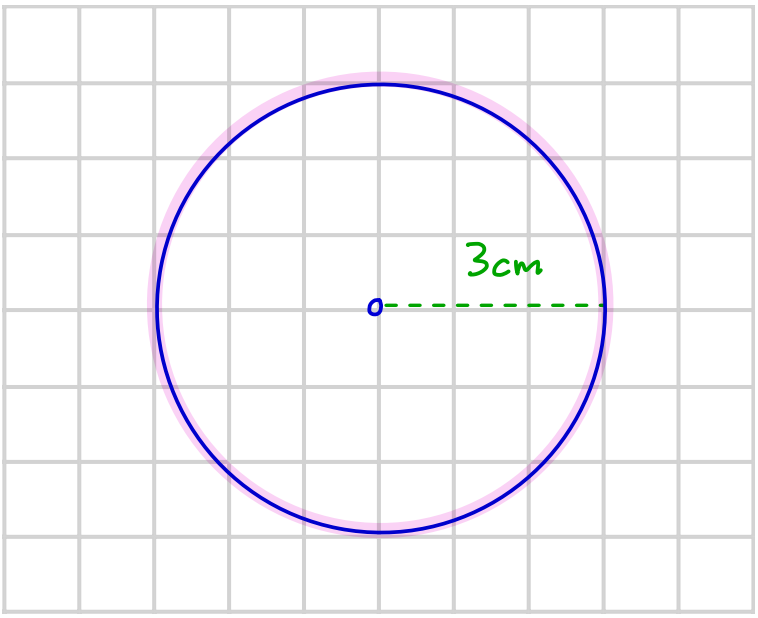
(Total marks for Question 17 is 4 marks)

1F24

18 (a) Draw a plan view of this cone on the centimetre grid.

Plan = Above ↓





height : radius = 5 : 1

×3 (5 : 1 / 15 : 3) ×3

(2)

(b) Calculate the circumference of the cone's base, in centimetres.
Give your answer in terms of π

$C = 2\pi r = \pi d$

Radius = 3 cm

Diameter = 3×2 = 6 cm

$C = \pi \times 6$

$= 6\pi$

6π ..... cm

(2)

(Total marks for Question 18 is 4 marks)

19 $\dfrac{4.85 \times 0.429}{0.0501}$

Keertan works out that the answer to this calculation is 0.04.
Use estimation to show that he is incorrect.

$5\overline{)200}$ = 040

$\dfrac{4.85 \times 0.429}{0.0501} \approx \dfrac{5 \times 0.4}{0.05} = \dfrac{2}{0.05} \overset{\times 100}{=} \dfrac{200}{5} = 40$ (×100 on both numerator and denominator)

Keertan is incorrect, his place value is out.

(Total marks for Question 19 is 3 marks)

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20 Here are some mixed numbers and fractions.

$2\frac{1}{6} = 1\frac{7}{6}$ $\quad 2\frac{1}{4}$ $\quad 2\frac{2}{3}$ $\quad \frac{25}{12} = 2\frac{1}{12}$

3 $\quad$ 2 $\quad$ 1 $\quad$ 4

(a) Sort them into descending order.

$2\frac{2}{3}$ $\quad 2\frac{1}{4}$ $\quad 2\frac{1}{6}$ $\quad 2\frac{1}{12}$

.....

(2)

(b) Find their range.

Biggest − smallest $= 2\frac{2}{3} - 2\frac{1}{12}$

$= \frac{2}{3} - \frac{1}{12}$

$= \frac{8}{12} - \frac{1}{12}$

$\frac{7}{12}$

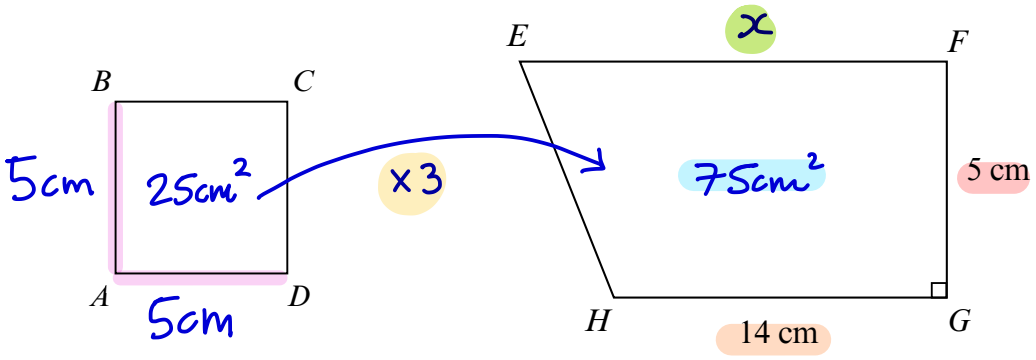
.....

(2)

(Total marks for Question 20 is 4 marks)

1F24

21 *ABCD* is a square.
EFGH is a trapezium.



ABCD has a perimeter of 200 mm.

x3 The area of the square is one third the area of the trapezium.

Work out the size of length *EF*. = x

200m = 20cm

Square side length = $\frac{20}{4}$ = 5 cm

Square Area = 5 x 5 = 25cm²

EFGH is a trapezium

$A = \frac{1}{2}(a+b)h \Rightarrow 75 = \frac{1}{2} \times (x+14) \times 5$

$150 = (x+14) \times 5$

$\frac{150}{5} = x + 14$

$30 = x + 14$

$16 = x$

16 ..... cm

(Total marks for Question 21 is 4 marks)

22 The table below gives information about the time taken for a group of 20 runners to complete a 5 km park run.

Time (t minutes)	Frequency	F	x midpoint	Fx estimated time
$20 < t \leq 22$	2	×	21	42
$22 < t \leq 24$	4	×	23	92
$24 < t \leq 28$	3	×	26	78
$28 < t \leq 32$	7	×	30	210
$32 < t \leq 36$	4	×	34	136
		+ 20		+ 558

(a) Find the modal class.

most common interval = largest frequency

$28 < t \leq 32$

(1)

(b) Work out an estimate for the mean time for the group.

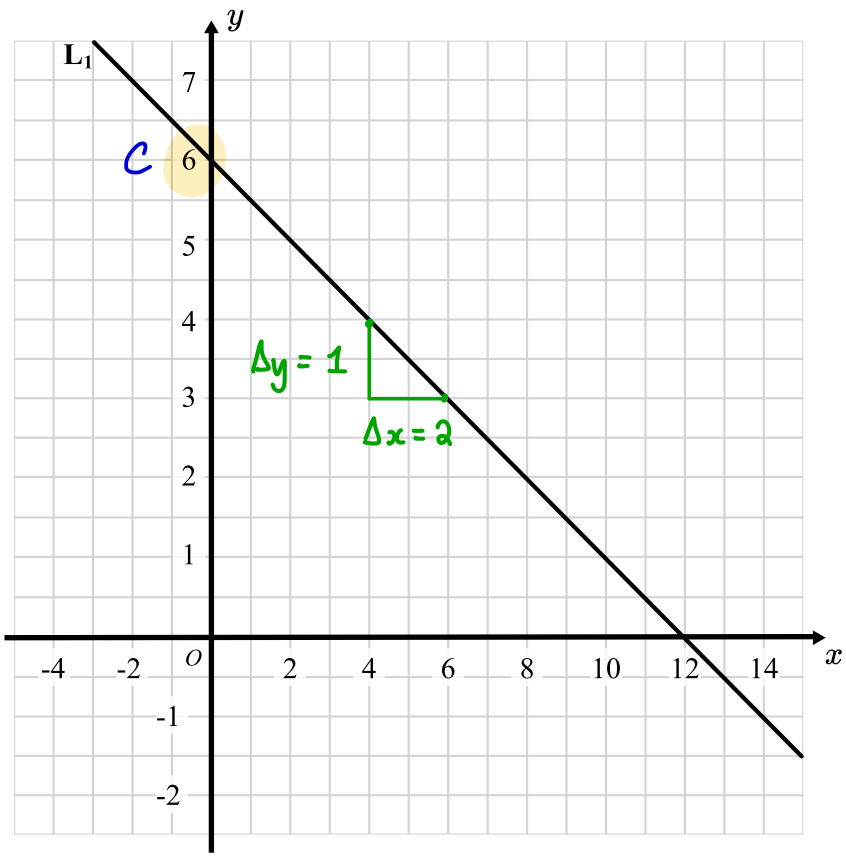
$$\text{mean} = \frac{\Sigma fx}{\Sigma x} = \frac{558}{20} = \frac{279}{10} = 27.9$$

27.9 minutes

(3)

(Total marks for Question 22 is 4 marks)

23 The line $\mathbf{L_1}$ is shown on the grid.



(a) Find the gradient of the line $\mathbf{L_1}$

$m = \frac{\Delta y}{\Delta x} = -\frac{1}{2}$

$-\frac{1}{2}$

(2)

(b) Write down the equation of the line $\mathbf{L_1}$ in the form $y = mx + c$

$y = mx + c$ ← y-intercept

↑ gradient

$y = -\frac{1}{2}x + 6$

(1)

(Total marks for Question 23 is 3 marks)

1F24

24 A car travels 45 miles in 40 minutes.
Work out the speed of the car in mph.

mph

1 hour = 60 mins

÷60

D = 45

$T = \frac{40}{60} = \frac{2}{3}$

$\therefore S = D \div T$

$= 45 \div \frac{2}{3}$

$= 45 \times \frac{3}{2}$

$= 67.5$ mph

(Total marks for Question 24 is 3 marks)

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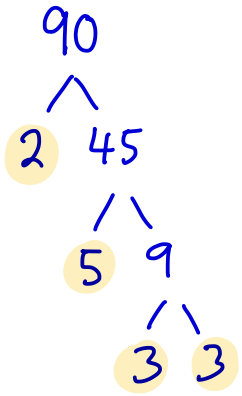
25 Express 90 as the product of its prime factors.
Give your answer in index form.



$90 = 2 \times 3 \times 3 \times 5$

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

(2)

(Total marks for Question 25 is 2 marks)

---

26 (a) Write 8104000 in standard form

8.104×10^6

(1)

(b) Write 6.1×10^{-4} as an ordinary number.

6.1

0.00061

0.00061

(1)

(Total marks for Question 26 is 2 marks)

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27 (a) Complete the table of values for $y = x^2 + 3x - 1$

x	-4	-3	-2	-1	0	1
y	3	-1	-3	-3	-1	3

$(-4)^2+3(-4)-1$
$= 16-12-1$
$= 3$

$(-2)^2+3(-2)-1$
$= 4-6-1$
$= -3$

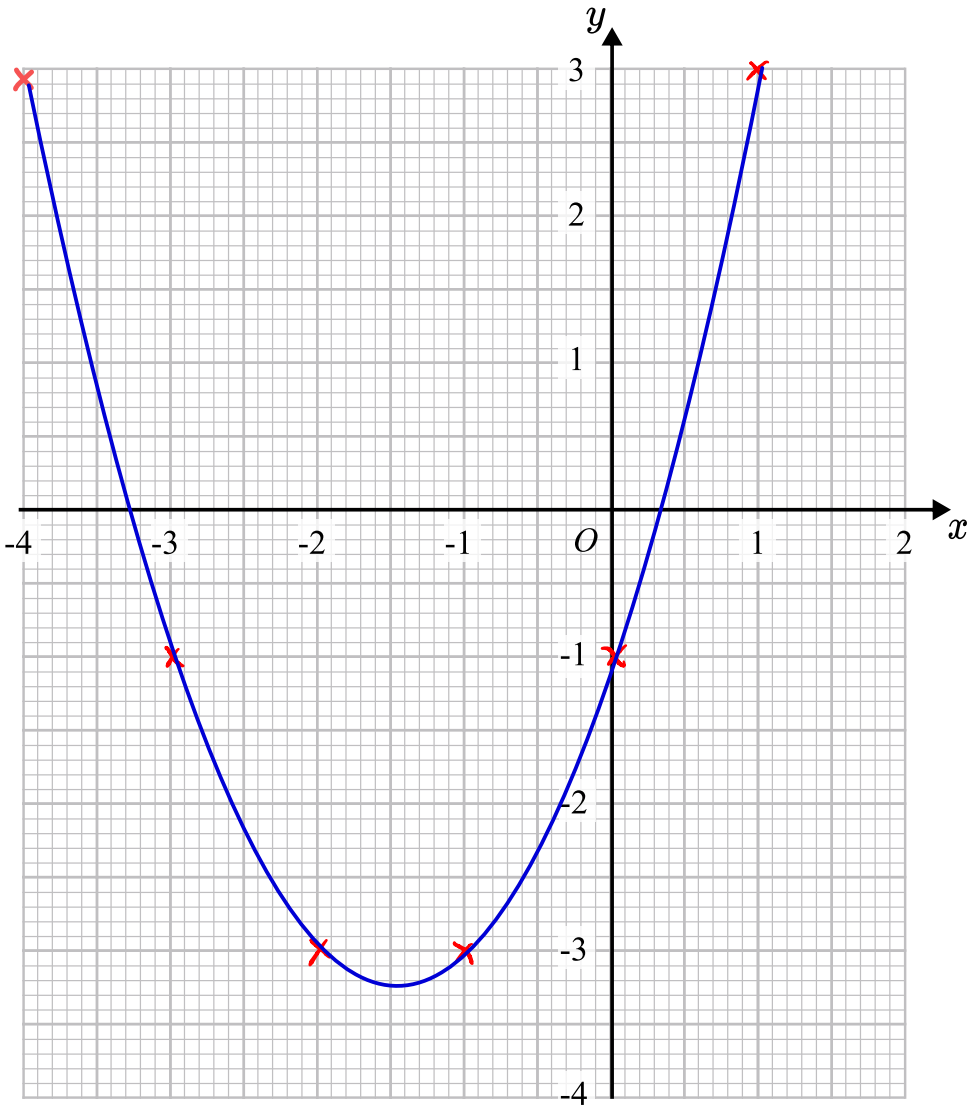
$(-1)^2+3(-1)-1$
$= 1-3-1$
$= -3$

$(0)^2+3(0)-$
$= -1$

(2)

(b) On the grid, draw the graph of $y = x^2 + 3x - 1$ for x values from -4 to 1

(2)



(Total marks for Question 27 is 4 marks)

28 (a) Expand and simplify $(x^2 + 3)(x^2 + 5)$

$(x^2+3)(x^2+5) = x^4 + 5x^2 + 3x^2 + 15$

$= x^4 + 8x^2 + 15$

(2)

(b) Simplify $\dfrac{a^7}{a^{-4}}$

$7 - (-4) = 11$

a^{11}

(1)

LHS = RHS

$(4 \times 2^3)^5 = 2^x$

(c) Find the value of x

$2^2 = 4$ $\quad \therefore$ LHS $= (2^2 \times 2^3)^5$

$= (2^5)^5$

$= 2^{25}$

$x =$ 25

(2)

(Total marks for Question 28 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS