Candidate surname	Other names

Maths Planner

AQA

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	FDP Conversions	/ 1
2	Fraction of Amounts	/ 1
3	Converting Metric Units	/ 1
4	Solving One-Step Equations	/ 1
5	Circle Properties	/ 1
6	Inequality Notation	/ 1
7	Order of Operations (BIDMAS)	/ 2
8	Time Calculations	/ 2
9	Simplifying Expressions	/ 2
10	Angles around a Point	/ 2
11	Averages / Primes	/ 3
12	Systematic Listing	/ 2
13	Proportion / Percentages	/ 5
14	Area / Perimeter	/ 4
15	Fraction Operations	/ 6

Q	Topic(s)	Marks
16	Pictograms / Ratio	/ 4
17	Percentage & Fractional Change	/ 4
18	Plans & Elevations / Circumference	/ 4
19	Area of Quadrilaterals	/ 4
20	Solving Inequalities / Number Line	/ 3
21	Standard Form	/ 4
22	Progressions	/ 4
23	Function Machines	/ 2
24	Reciprocals	/ 2
25	Ratio 1:n	/ 1
26	Equation of Straight Lines	/ 1
27	Grouped Frequency Tables	/ 2
28	Pythagoras	/ 3
29	Laws of Indices	/ 4
30	Column Vectors	/ 4

Answers all questions in the spaces provided.

Do not write outside the box

1 Write 85% as a decimal.

$85 \div 100 = 0.85$

[1 mark]

Answer 0.85

2 Work out $\frac{1}{7}$ of 35

[1 mark]

$35 \div 7 = 5$

Answer 5

3 Write 2.5 kilograms in grams.

[1 mark]

1kg = 1000g

×1000

$2.5 \times 1000 = 2500$g

Answer 2500 g

4 Solve $9x = 54$

[1 mark]

$9x = 54$ ÷9

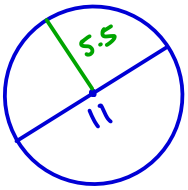
$x = 6$

Answer $x =$ 6

Do not write outside the box

5 A circle has a diameter of 11cm.
Write down the length of the radius.

[1 mark]



$r = \frac{d}{2} = \frac{11}{2} = 5.5$

Answer 5.5 cm

6 $x \geq y$

Write the **meaning** of this statement in words.

[1 mark]

x is greater than or equal to y.

7 Work out $32 \div 2^3 + 5^2$

[2 marks]

BIDMAS

$2^3 = 2 \times 2 \times 2 = 8$

$5^2 = 5 \times 5 = 25$

$= 32 \div 8 + 25$

$= 4 + 25$

$= 29$

Answer 29

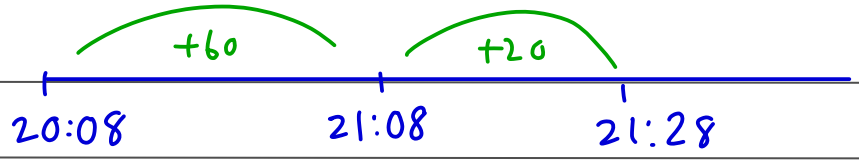
8 A movie starts at 20:08

It runs for $1\frac{1}{3}$ hours.

$\frac{1}{3}$ of 60 = 20 mins

What time does the movie end?

[2 marks]



Answer 21:28

Do not write outside the box

9 Simplify $8a - 3b + 5a - b$

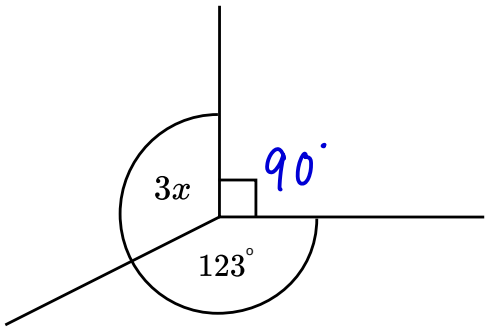
[2 marks]

$8a + 5a = 13a$

$-3b - 1b = -4b$

Answer $13a - 4b$

10 The diagram shows angles around a point.



Work out the value of x

[2 marks]

$90 + 123 = 213$

$360 - 213 = 147°$

$3x = 147°$ (÷3)

$x = 49$ (÷3)

$$\begin{array}{r} 5 \\ 3\,6\,\not{0} \\ -\ 2\,1\,3 \\ \hline 1\,4\,7 \end{array}$$

$$\begin{array}{r} 049 \\ 3\overline{)1^{1}4^{2}7} \end{array}$$

Answer $x =$ 49

Do not write outside the box

11 For a set of five numbers,

the median is 7 middle

the mode is 4 most common

the range is 9 Biggest - Smallest = 9

three of the numbers are prime

Work out the **only** possible set of five numbers.

[3 marks]

4 + 9 = 13

Primes: 2, 3, 5, 7, 11, 13, 15, ...

Answer 4 4 7 11 13

12 Two games are played.

In each game you can either **Win**, **Draw** or **Lose**.

Complete all the possible outcomes of results from playing the two games.

[2 marks]

W W	W D	W L
D W	D D	D L
L W	L D	L L

Do not write outside the box

13 120 students were asked about their average daily screen time.

Here are the results.

	Less than 6 hours	6 hours or more
Year 7	26	24
Year 11	28	42

13 (a) What proportion of Year 7 students use their phone for **less than 6 hours**?

[2 marks]

$\frac{\square}{\square}$

$26 + 24 = 50$

Answer $\frac{26}{50} = \frac{13}{25}$

13 (b) What percentage of students use their phone for **6 or more hours**?

[3 marks]

120 students in total.

6 hours or more = $24 + 42 = 66$

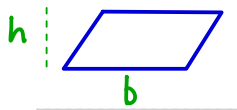
$\frac{66}{120} = \frac{11}{20} = \frac{55}{100}$ (÷6, ×5; ÷6, ×5)

Answer 55 %

Do not write outside the box

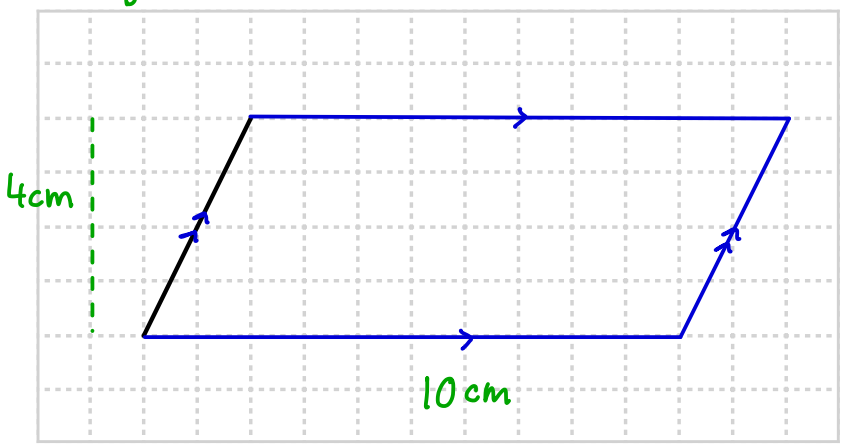
14 (a) One side of a parallelogram is drawn on this centimetre grid.
The parallelogram has **no** right angles.
Complete the parallelogram so it has an **area** of 40 cm²

[2 marks]



Area = b × h

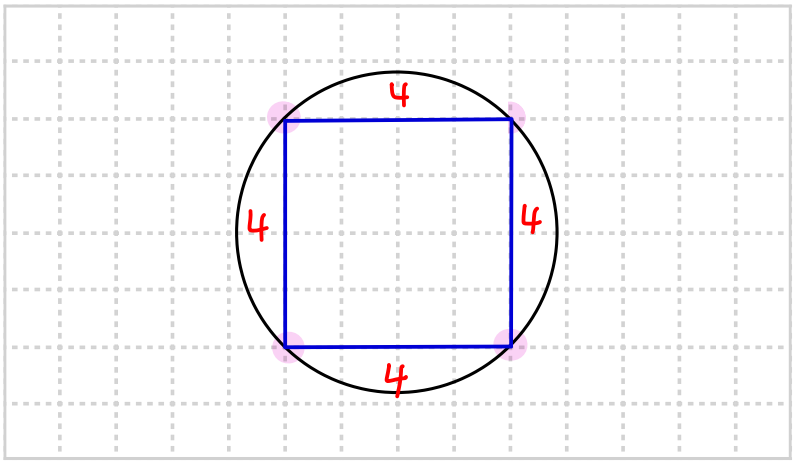
$b = \frac{40}{4} = 10$



14 (b) Each vertex of a square touches the circumference of the circle below.
Work out the perimeter of this square.

[2 marks]

'corner'



$P = 4 + 4 + 4 + 4$

Answer 16 cm

Do not write outside the box

15 (a) Work out $2 \div \frac{3}{7}$

'KCF'

Give your answer as a mixed number.

[2 marks]

$\frac{2}{1} \div \frac{3}{7} = \frac{2}{1} \times \frac{7}{3} = \frac{14}{3}$

Answer $4\frac{2}{3}$

Here are some fractions

$\frac{3}{2}$ (×12) $\quad \frac{2}{3}$ (×8) $\quad \frac{5}{8}$ (×3) $\quad \frac{5}{6}$ (×4) $\quad \frac{1}{4}$ (×6)

15 (b) Work out their median.

[2 marks]

$\frac{36}{24} \quad \frac{16}{24} \quad \frac{15}{24} \quad \frac{20}{24} \quad \frac{6}{24}$

$\frac{6}{24} \quad \frac{15}{24} \quad \frac{16}{24} \quad \frac{20}{24} \quad \frac{36}{24}$

Answer $\frac{16}{24}$ or $\frac{2}{3}$

15 (c) Work out their range.

Biggest − Smallest

[2 marks]

$= \frac{36}{24} - \frac{6}{24} = \frac{30}{24}$

Answer $\frac{30}{24}$ or $\frac{5}{4}$ or $1\frac{1}{4}$

Do not write outside the box

16 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

16 (a) How many Romance movie tickets were sold?

[1 mark]

24 + 6 = 30

Answer 30

16 (b) A total of 144 tickets were sold.

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

Complete the pictogram.

[3 marks]

60 + 30 = 90

144 − 90 = 54

A : H total

2 : 1 3) x 18

x18 (

36 : 18 54

Do not write outside the box

17 A house was purchased at the start of 2019 for £435,000.

By the end of 2022 the house had **increased** in value by 12%

Between 2022 and 2023 the price **decreased** in value by $\frac{1}{20}$

Work out the value of the house at the end of 2023.

[4 marks]

10% = 435000 ÷ 10 = £43,500

1% = 435000 ÷ 100 = £4,350

2% = 4,350 × 2 = £8,700

12% = 43500 + 8700 = £52,200

∴ At the end of 2022 = £435,000 + £52,200

= £487,200

↓ $\frac{1}{20}$: $\frac{487200}{20} = \frac{48720}{2}$

= £24,360

2 4 3 6 0
2 | 4 8 7'2 0

∴ At the end of 2023 = £487200 - £24360

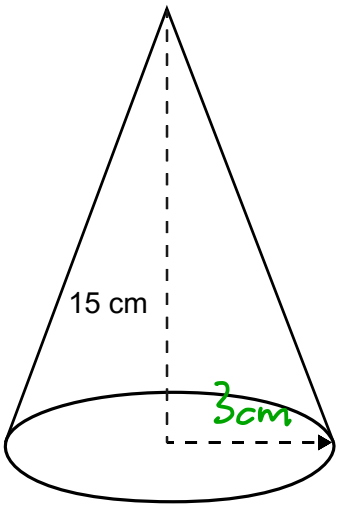
= £462,840

Answer £ 462,840

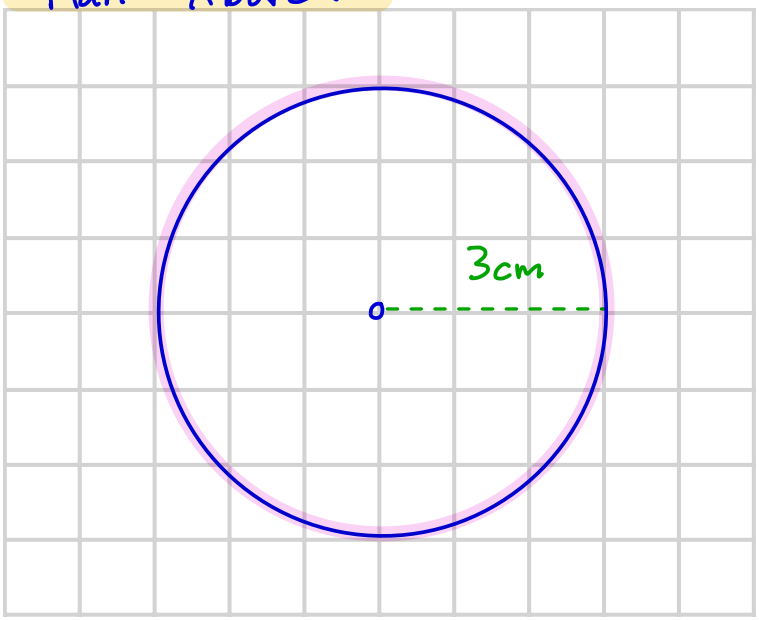
Do not write outside the box

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

[2 marks]



Plan = Above ↓



height : radius $= 5 : 1$

×3 (5 : 1) ×3
15 : 3

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

[2 marks]

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

$C = \pi \times 6$

$= 6\pi$

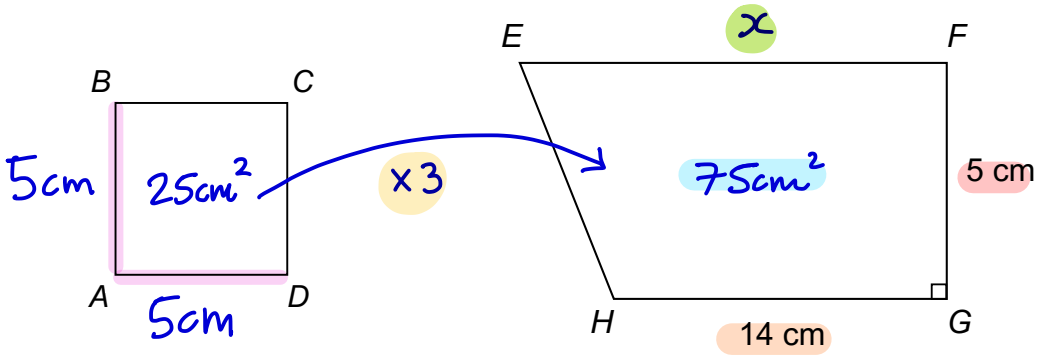
Radius = 3 cm

Diameter = 3 × 2
= 6 cm

Answer 6π

Do not write outside the box

19 *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

[4 marks]

200m = 20cm

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

Square Area = 5 x 5 = 25cm²

EFGH is a trapezium

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

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

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

$30 = x + 14$

$16 = x$

Answer 16 cm

Do not write outside the box

20 (a) Solve $5 < 4n - 3 \leq 25$

[2 marks]

+3 +3

$8 < 4n \leq 28$

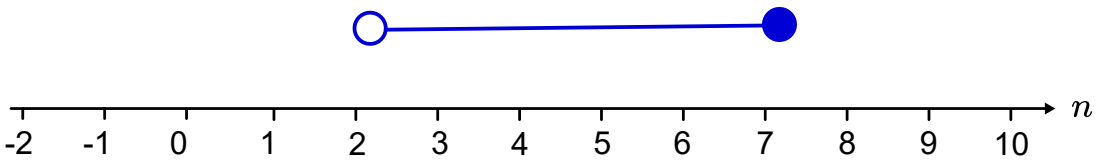
÷4 ÷4

$2 < n \leq 7$

Answer $2 < n \leq 7$

20 (b) Represent the inequality for n on the number line below.

[1 mark]



Do not write outside the box

21 (a) Tick the **correct** box for this statement.

[1 mark]

	False	True
$5.2 \times 10^{-3} = 0.00052$	✓	

21 (b) Joanne is asked to write an answer to a question in standard form.

She writes 23.1×10^{-4}

The teacher marks it incorrect, explain why.

[1 mark]

Standard Form must be between 1-10 ... 23.1 is not.

21 (c) Work out $4 \times 5.1 \times 10^3$

Give your answer in standard form

[2 marks]

51
× 4
204

$4 \times 5.1 \times 10^3 = 20.4 \times 10^3$

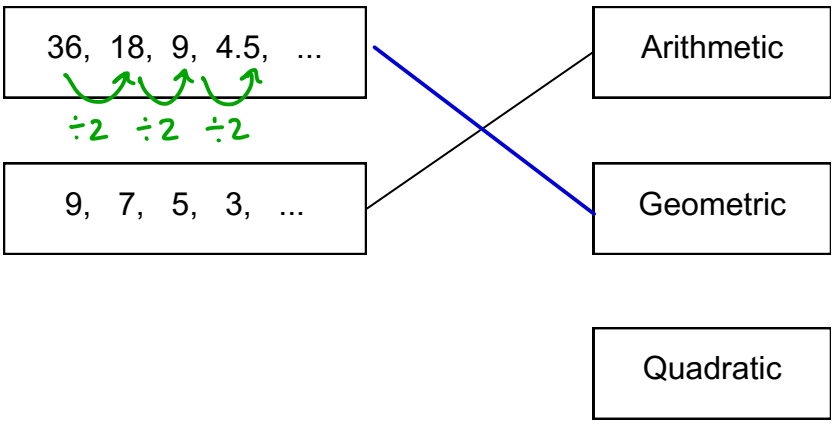
$= 2.04 \times 10^4$

Answer 2.04×10^4

Do not write outside the box

22 (a) Match the progression on the left with the correct type on the right.
One has been done for you.

[1 mark]



22 (b) A geometric progression has the nth term ar^n

Where,

a is the first term
r is the common ratio
n is the term position

If $a = 3$ and $r = 2$

Work out the first three terms of the progression.

[3 marks]

$ar^n \Rightarrow 3 \times 2^n$

1st term (n=1): $3 \times 2^1 = 6$

2nd term (n=2): $3 \times 2^2 = 3 \times 4 = 12$

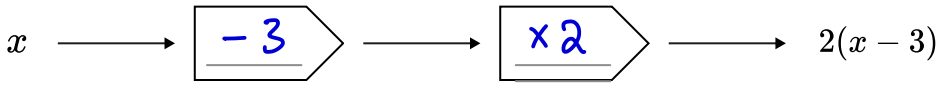
3rd term (n=3): $3 \times 2^3 = 3 \times 8 = 24$

Answer 6, 12, 24

×2 ×2

Do not write outside the box

23 Here is a function machine.



Complete the function machine.

[2 marks]

24 Write down the reciprocal of 0.8

Give your answer in its simplest form.

"flip"

[2 marks]

$0.8 = \frac{8}{10} \iff \frac{10}{8} = \frac{5}{4}$

Answer $\frac{5}{4}$ or $1\frac{1}{4}$

25 The ratio $x : y = 2 : 3$

If $x : y = 1 : n$

Write down the value of n

$x : y$

$2 : 3$ (÷2)

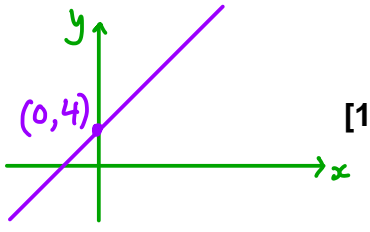
$1 : \frac{3}{2}$ (÷2)

[1 mark]

Answer $\frac{3}{2}$ or 1.5

26 A straight line has the equation $y = 4 + 5x$

Write down the coordinates of the y-intercept



$y = mx + c$

[1 mark]

Answer (0,4)

Do not write outside the box

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

Time (t minutes)	Frequency
$20 < t \leq 22$	2
$22 < t \leq 24$	4
$24 < t \leq 28$	3
$28 < t \leq 32$	7
$32 < t \leq 36$	4

6
9
16 ← median
20

Tick **one box** for each statement.

[2 marks]

	Cannot be true	**Might be true**	**Definitely true**
The range of the running times is 16 minutes	☑	☐	☐
The median running time was 31 minutes	☐	☑	☐

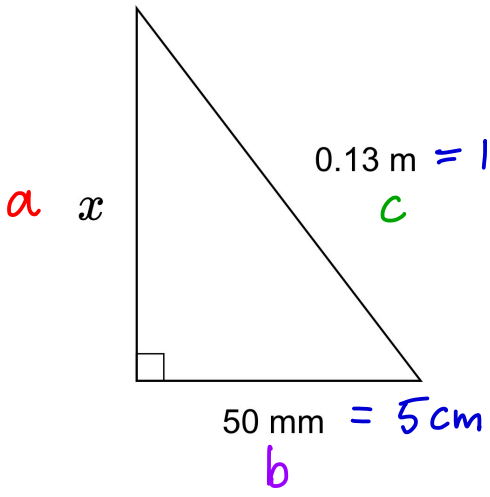
Fastest time ≠ 20

$\frac{20+1}{2} = 10.5^{th}$ runner.

Do not write outside the box

28 Use Pythagoras to work out the value of x, in centimetres.

[3 marks]



1 cm = 10 mm

1 m = 100 cm

$a^2 + b^2 = c^2$

$5 \times 5 = 25$

$x^2 + 5^2 = 13^2$

$x^2 + 25 = 169$

$x^2 = 169 - 25$

$x^2 = 144$

$x = \sqrt{144}$

$= 12$

$13 \times 13 = 169$

$169 - 25 = 144$

Answer 12 cm

Do not write outside the box

29 **(a)** Simplify $(2b^3)^3$

NB: $(a^n)^m = a^{n \times m}$

[2 marks]

$(2b^3)^3 = 2^3 b^9$

$= 8b^9$

Answer $8b^9$

LHS = RHS

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

Find the value of x

[2 marks]

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

$2^2 = 4$

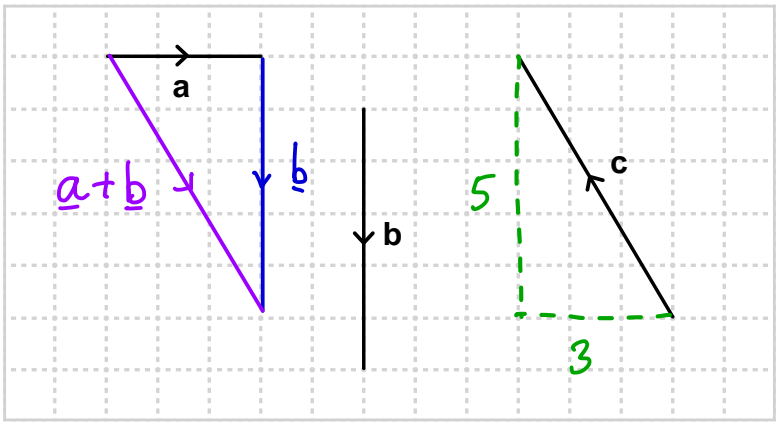
$= (2^5)^5$

$= 2^{25}$

Answer $x = 25$

Do not write outside the box

30 The diagram shows the vectors **a**, **b** and **c**.



30 (b) What is **c** as a column vector?

[2 marks]

Answer $\begin{pmatrix} -3 \\ 5 \end{pmatrix}$

30 (b) Work out **a** + **b** as a column vector.

[2 marks]

$\begin{pmatrix} 3 \\ 0 \end{pmatrix} + \begin{pmatrix} 0 \\ -5 \end{pmatrix} = \begin{pmatrix} 3 \\ -5 \end{pmatrix}$

Answer $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$

END OF QUESTIONS