Paper 3 Revision F

Key topics to practice for 11th June

USE A CALCULATOR,

FIND A CALCULATOR,

USE A CALCULATOR

All the topics listed below are likely to appear in some form in paper 3.

Scan the QR Code for solutions

Very Likely topics

Symmetry	Perimeter	Listing Outcomes	Venn diagrams
Use of Calculator	Speed, Distance, Time	Transformations	Draw/use straight line graphs
Pie Charts			



<u>SYMMETRY</u>

Q1.Circle the letter of the shape that has **exactly one** line of symmetry.



(Total 1 mark)

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Q2. Here are four shapes.

	Α				В		
	С				D		

Circle your answers for each part.

- (a) Which of these shapes have line symmetry?
 A B C D
 (2)
 (b) Which of these shapes have rotational symmetry of order 2?
 A B C D
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
 (2)
- **Q3.** Circle the order of rotational symmetry of this drawing.



Shapes X and Y are shown on a centimetre grid.



PERIMETER

Q6.Here are some shapes.

Each shape has an area of six square centimetres.

A		3	С
			_
D Which has the big You must show t	iger perimeter, shape A o he lengths of both perime	eters.	
D Which has the big You must show t	ger perimeter, shape A c	or shape B ? eters.	
D Which has the big You must show t	ger perimeter, shape A c	eters. Answer _	
D Which has the big You must show t	iger perimeter, shape A of he lengths of both perimeter	eters.	
D Which has the big You must show t	iger perimeter, shape A on the lengths of both perimeter and the lengths	eters. Answer _	
D Which has the big You must show t Which shape is co Which two shape	iger perimeter, shape A on the lengths of both perime ongruent to shape A ?	E or shape B ? eters. Answer _ Answer _	
D Which has the big You must show t Which shape is co Which two shape	iger perimeter, shape A of the lengths of both perime ongruent to shape A ? Is fit together to make a re Answer	E or shape B ? eters. Answer _ Answer _	and
D Which has the big You must show t Which shape is co Which two shape	iger perimeter, shape A of the lengths of both perime ongruent to shape A ? s fit together to make a re Answer	E or shape B ? eters. Answer _ Answer _	and



(2) (Total 6 marks)

Q7.

Here is a parallelogram.



Circle the expression for the **perimeter**.

2s + 2w

SW

2sw

(Total 1 mark)



s + w

LISTING OUTCOMES

Q8.

Cards with the letters L, M and P are placed next to each other.

(a) List all the possible orders of the letters. One has been done for you.



(2)

(b) The three cards are placed next to each other at random.

What is the probability that L is the middle letter?

Answer _____

(1) (Total 3 marks)



The two arrows are spun.

One possible outcome is **red** and **1**.

Write down **all** the other possible outcomes.

(Total 2 marks)

Q10.

When a spinner is spun, it shows

Blue (B) or Green (G) or Red (R) or White (W).

When a coin is tossed, it shows

Heads (H) or Tails (T).

The spinner is spun and the coin is tossed.

Complete this list of possible outcomes.

BH

(Total 2 marks)

VENN DIAGRAMS

Q11.

In the Venn diagram

 ξ = Whole numbers from 1 to 12 inclusive

M = Multiples of 3

F = Factors of 24



Put the numbers from 1 to 12 in the Venn diagram.

(Total 4 marks)

Q12.

A walking group has 210 members.

One week, the group organised a walk on Wednesday and a walk on Saturday. The frequency tree shows how many members went on the walks.



Show the information on the Venn diagram.

 $\xi = 210$ members

W = members who went on the Wednesday walk

S = members who went on the Saturday walk



(Total 4 marks)

Q13.

During Year 9 a school runs a trip to the cinema and a trip to bowling.

125 students go to the cinema.

120 students go to bowling.

- 52 students go to both the cinema and bowling.
- 47 students do **not** go on either trip.

How many students are there in Year 9?

You may use the Venn diagram to help you.



______Answer _____

(Total 3 marks)

USE OF CALCULATOR

Q14. Use your calculator to work out

5.	9.75 ³	
(a)	Use your calculator to work out $\frac{1.875}{1.875}$ + 6.4 ⁻	
	Give your answer as a decimal.	
	Write down your full calculator display.	_
		-
	Answer	-
(b)	Is your answer to part (a) sensible?	
	Check by rounding each of 9.75, 1.875 and 6.4 to the nearest whole number.	
	You must show your working.	
		-
	Tick a box.	-
	Sensible Not sensible	
	(Total 5	ma
6.		
	k out the value of $3^6 - \sqrt{841}$	
Wor		

Q17. An approximation for the value of π is given by

$$4\left(1 - \frac{22}{57} + \frac{22}{85} - \frac{22}{105} + \frac{22}{117} - \frac{22}{242}\right)$$

Use your calculator to show that this approximation is within 0.1 of 3.14

(Total 2 marks)

SPEED, DISTANCE, TIME

Q18. A car travels 3.5 miles in 5 minutes.

Work out the average speed in miles per hour.

Answer _____

____ mph (Total 3 marks)

Q19.

The table shows information about journeys A and B. Complete the table.

	Distance travelled	Time taken	Average speed
А	14 miles		56 mph
В		1 hour 20 minutes	39 mph

⁽Total 2 marks)

Q20.

Tom and Adil are the two runners in a 200-metre race.

Tom completes the race in 24 seconds.

Adil completes the race at an average speed of 28.8 kilometres per hour.

Who wins the race?

You **must** show your working.

Answer

(Total 3 marks)

TRANSFORMATIONS



(a)



(b) Point *C* is reflected in the line x = 6 to point *D*. Work out the coordinates of *D*.

> Answer (_____, ___) (1) (Total 2 marks)

Q22.

Describe fully the **single** transformation that maps shape A to shape B.



(Total 3 marks)









у ▲ 6 5 4 3 2 1 ► x _1 0 -3 -2 2 3 6 -6 -5 -4 4 1 5 -1 -2 -3 -4 -5 -6

(2)

Q24.

On this grid, shape C is shown.

One side of shape D is also shown.



Complete shape D so that it is an enlargement of shape C with scale factor 2

(Total 1 mark)

Draw/Use Straight Line Graphs

Q25.

Use this table of values to draw the graph of y = 2x + 3 for values of x from -3 to 3



(Total 2 marks)

Q26.

(a) Complete the table of values for y = 2x + 1

x	-1	1	3
у	-1	3	

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



(c) On the grid draw the line y = 5

(1) (Total 4 marks)

(2)

(1)

Q27.

(a) Complete the table for y = 2x + 3

x	-3	-2	-1	0	1	2	3
у	-3		1		5		

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



(2)

x = 2x + 3(C) Solve



PIE CHARTS



Q28. The pie chart shows information about people at a fair during three days.

There were 132 more people on Friday than on Thursday.

Work out the number of people on Saturday.

Answer _____

(Total 3 marks)

Q29.

60 people were asked if they would vote in an election.

- 1
- $\overline{4}$ of the people said No
- 20 people said Yes
- The rest said Maybe

Draw and label a pie chart to show this information.



(Total 3 marks)

END OF QUESTIONS

Mark schemes

Q1.

Ρ

B1 [1]

Q2.

(a)	A, B and I		
		B1 for 2 correct and no incorrect	B 2
			D2
(b)	C and D		
		B1 for 1 correct and no incorrect	B2
			[4]

Q3.

x0.	
8	
	B1
	[1]

Q4.

(a)	Hexagon	B1
(b)	Valid reason eg all sides are not equal or all angles are not equal	
	Additional Guidance Ignore incorrect or irrelevant statements alongside correct statements, unless contradictory	B1

There are no lines of symmetry	B1
It has reflex angles	B1
Regular polygons must have equal sides	B1
All sides are different (condone)	B1
Some sides are more than 1 cm	B1

		lt doesn't h	ave a line of symmetry		
		It doesn't have one line of symmetry			
			allow in words	B1	
		4			
			allow in words	B 1	
					[4]
Q5	5.				
	paral	lelogram		B1	
					[1]
Q6) .				
	Com (a)	ments A			
		and			
		(A =) 14 an	ud (B =) 12		
			B1 (A =) 14 or (B =) 12 14 and / or 12 may be on the diagram		
			accept 140 and 120	DA	
		Additional	Guidance	B2	
		Ignore refe	rence to areas of any shapes and perimeters of the other shapes		
		Ignore units	s, including for 140 and 120		
		lf answer li	ne blank, accept A clearly indicated in working		
		Accept 14	on the answer line in place of A with 12 seen for B		
				B2	
	(b)	D		B1	
	(c)	C and E			
			either order	B1	
	(d)	Any correct	t reflection of shape with corresponding mirror line shown B1 any correct reflection of shape with no or incorrect mirror		
			line	B2	

Additional Guidance

Mark intention for mirror line and shape

Ignore internal lines

For B2, if there is more than one shape and / or more than one mirror line, apply the rules of choice

For B1, any one correct reflection of the shape (even with other incorrect shapes) will score B1

Q7.

2s + 2w

Q8.

LPM		
PLM		
PML	Any order	
MLP		
MPL	B1 for at least two more correct orders	B2
$\frac{2}{6}$	oe $\frac{1}{3}$ ft their (a) if at least one extra order given	
	LPM PLM PML MLP MPL	LPM PLM PML Any order MLP MPL B1 for at least two more correct orders $\frac{2}{6}$ oe $\frac{1}{3}$ ft their (a) if at least one extra order given

B1ft

[3]

[6]

[1]

B1

Q9.

(red, 1)	
red, 2	
red, 3	
blue, 1	
blue, 2	
blue, 3	B1 for 4 correct

B1 for 5 correct and 1 incorrectB0 for 5 correct and 2 incorrectB0 for 4 correct and 1 incorrectIgnore repeats (which may be reversed)

B2

B2

Q10.

ΒH	ΒT
GΗ	GΤ
RΗ	RΤ
WН	WТ

with no errors or repeats

any configuration accept words B1 five of BT GH GT RH RT W H W T

Additional Guidance

eg T B means B T so if both seen it is a repeat

Condone repeats or errors for B1 but not B2

Allow B H to be written again if list restarted

Do not count clear working as a repeat eg table used to work out combinations and then separate list given as answer

Q11.



B3 Exactly one value in wrong region or omitted B2 Exactly two, three or four in wrong region or omitted B1 At least three in correct region and B2, B3 or B4 not scored. [2]

B4

Q12.

25 in W only

53 in the intersection

B1

68 in S only

64 outside the circles

Additional Guidance



B1B1B1B1

M1

M1

A1

B1

B1

B1

Q13.

Alternative method 1

125 – 52 or 73

or

120 - 52 or 68

May be seen in cinema only section of the Venn diagram May be seen in bowling only section of the Venn diagram

(125 - 52) (+) (120 - 52) (+) 52 (+) 47

or 73 (+) 68 (+) 52 (+) 47

Fully correct Venn diagram

240

Alternative method 2

	125 -	+ 120 – 52 or 193	M1	
	their	193 + 47 125 + 120 = 52 + 47 gate M2		
		$123 \pm 120 = 32 \pm 47$ gets iviz	M1	
	240		A1	[3]
01	1			
QI	4. (a)	24	B1	
	(b)	7.5(26)	B 1	
	(c)	6.25 or $6\frac{1}{4}$ or $\frac{25}{4}$	B1	[3]
Q1	5.			
	(a)	494.325 or $\frac{19773}{40}$ or $494\frac{13}{40}$		
		or		
		40.96 or $\frac{1024}{25}$ or $40\frac{24}{25}$		
		535.29 or 535.3 or 200		
		or 535 200	M1	
		535.285	A1	
		Additional Guidance		
		Ignore any subsequent truncation or rounding if 535.285 seen in working	M1A1	
	(b)	10 ³ and 2 and 6 ²		
		and 536		
		and indicates Sensible ft correct decision for comparing 536 with their 535.285 B2 10 ³ and 2 and 6 ² seen		

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Additional Guidance

Students must give the correct ft decision for part (a) for B3

Correct decision for their (a) should be Sensible if their 535.285 is 530 or 540 to 2 sf. Otherwise they should indicate Not sensible

Condone e.g. 10.00 for 10 etc

Q16.

(3⁶ =) 729 seen or ($\sqrt{841}$ =) 29 seen

700

Q17.

3.041...

condone 3.042

3.14 - 3.041 = 0.09
or
3.041 + 0.1 = 3.141
or
3.041 and 3.14 - 0.1 = 3.04
oe
condone 3.042 for 3.041

Additional Guidance

Must see calculation for the A mark

Do not allow use of a more precise value of $\boldsymbol{\pi}$ for the A mark

Q18.

Alternative method 1

60 ÷ 5 or 12 or 3.5 ÷ 5 or 0.7 *oe*

M1

[5]

[2]

M1

A1

M1

A1

[2]

their 12 × 3.5	
or	
their 0.7 × 60	
oe	M1den
	in the p
42	A1
Alternative method 2	
7 (miles) in 10 (minutes)	
or 10.5 (miles) in 15 (minutes)	
or 14 (miles) in 20 (minutes)	
or 21 (miles) in 30 (minutes)	
or 35 (miles) in 50 (minutes)	M1
7 × 6	IVII
or 10.5 × 4	
or 14 × 3	
or 21 × 2	
or 35 + 3.5 × 2	
oe	Midan
42	Mildep
	A1
Alternative method 3	
5 ÷ 60 or 0.08(3)	
oe	M1
	1411
3.5 ÷ their 0.08(3)	
Oe	M1dep
42	_
42 Accept [42 42 2]	
,,,,,,	A1
Additional Guidance	
5 1	
$\frac{3}{60}$ or $\frac{1}{12}$ is of 0.08(3)	
	M1

[3]

Q19. 15 minutes or $\frac{1}{4}$ hour oe

52 (miles)

Q20.

20. Alternative method 1 – compares speeds in m/s	
200 ÷ 24 or 8.3(3) oe eg $\frac{200}{24}$ or $8\frac{1}{3}$	М1
28.8 × 1000 ÷ 60 ÷ 60 or 8 oe eg 28800 ÷ 3600 or 28.8 ÷ 3.6	M1
8 and 8.3(3) and Tom oe eg 8 and $8\frac{1}{3}$ and Tom	A1
Alternative method 2 – compares speeds in km/h	
200 ÷ 24 or 8.3(3) oe eg $\frac{200}{24}$ or $8\frac{1}{3}$	M 1
their 8.3(3) ÷ 1000 × 60 × 60 or 30 oe eg 0.008 3(3) × 3600 M1d	lep
30 and Tom	A1
Alternative method 3 – time for Adil starting with m/s	
28.8 × 1000 ÷ 60 ÷ 60 or 8 oe eg 28800 ÷ 3600	М1
$200 \div \text{ their 8 or 25}$ $oe \ eg \ 8$ Mid	lep
25 and Tom oe eg Tom by 1s	A1

Alternative method 4 – time for Adil starting with km/h

200 ÷ 1000 28.8 or [0.0069, 0.007] **B1** [2]

or $\frac{200}{28.8}$ or [6.9, 7] oe eg $\frac{0.2}{28.8}$ eg $\frac{125}{18}$	M1
their [0.0069, 0.007] × 60 × 60	
or	
their [6.9, 7] ÷ 1000 × 60 × 60	
or 25 oe eg $\frac{0.2}{28.8} \times 3600$	M1dep
25 and Tom	
oe eg Tom by 1s	A1
Alternative method 5 – distance for Adil in 24s	
28800 × 24 or 691 200	
or	
28.8 ÷ 60 ÷ 60 or 0.008	
or	
28.8 × 24 or 691.2	
$oe eg \frac{3456}{5}$	M1
their 691200 ÷ 60 ÷ 60	
or	
their 0.008 × 1000 × 24	
or	
their 691.2 × 1000 ÷ 60 ÷ 60	
or	
192	
oe eg 28800 × 24 ÷ 3600	M1dep
192 and Tom	

A1

Additional Guidance

Up to M2 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts

Ignore all units

Allow other correct comparisons

M1M1

eg 500 and 480 and Tom

M1M1A1

	1		1		
200 m = 0.2 km, 24 s = 24 ÷ 60 ÷ 60 =	150	hour, 0.2 ÷	150	= 30 and Tom	
					M1M1A1

200÷1000	1			
24	120	(or 0.0083)		
		· · · ·		M1

[3]

B1

B1

[2]

Q21.

(a) (-2, -1)

Additional Guidance

Check the diagram if answer line is blank

(b)	(8, -1)		
		SC1 (–1, –2) in (a) and (–1, 8) in (b)	

Additional Guidance

Check the diagram if answer line is blank

Q22.

Alternative method 1	
Rotation	B1
180° or half turn ignore clockwise or anticlockwise	B1
Origin or (0, 0) or <i>O</i>	B1

Alternative method 2

Enlargement	B1
(Scale factor) –1	B1
Origin or (0, 0) or <i>O</i>	B1
Additional Guidance	
Accept eg rotate for rotation and condone rotational symmetry	
Do not accept turn for first B1	
Accept 180 for 180°	
Accept 0, 0 for origin	
Do not accept centre of grid for origin	
Reflection on (0, 0)	B0B0B1
Choice of transformations eg rotation (and) $\begin{pmatrix} 4\\4 \end{pmatrix}$ or rotation (and) flip	1st B0
Combined transformation	max B0B1B1

Q23.

(a)



B1 for line x = 2 shown B1 for reflection in y = 2B1 for any reflection in a line of form x = a where a is less than 2.

B2

[3]





B2

B1

[4]

Q24.

Enlargement drawn with scale factor 2 using given side any orientation

Additional Guidance

Mark intention

Ignore any labels



		······································		
	ļ			
	L			
	-			
	1		B1	
				[1]
02	25.			
	2 or	3 correct plots		
		$\pm \frac{1}{2}$ square tolerance	M1	
	Fullv	correct straight ruled line from $(-3, -3)$ to $(3, 9)$		
	,	$\pm \frac{1}{2}$ square tolerance		
			AI	
	Add	itional Guidance		
	2 or first	3 correct points from (–3, –3) (–2, –1) (–1, 1) (0, 3) (1, 5) (2, 7) (3, 9) for the M1		
	lano	re additional points		
	5			[2]
~				
Qź	26.			
	(a)	7	B1	
	(h)	Points correctly plotted		
	(0)	ft from their table		
			M1	
		Correct line drawn for $-1 \le x \le 3$	A1	
	(c)	v = 5 drawn		
	x - 7			

B1



[4]

their 55 × 360 or 864

Ac	Additional Guidance				
61	2	A1			
. .	M	raep			
	2.4 × 105 is M2	1 dan			
	12 × 51 is M2				
	2.4 × their 255 is M2				
	Oe				
or	their 255 ÷ 132				
	their 55				
or	their 55 \times (80 + 25) or 252				
	132				
or	$\frac{132}{\text{their 55}} \times \text{their 255}$				
or	$\frac{132}{\text{their 55}} \times 25 \text{ or } 60$				
or	$\frac{132}{\text{their 55}} \times 80 \text{ or } 192$				

Up to M2 may be awarded for correct work, with no answer or incorrect answer, even if this is seen amongst multiple attempts

Q29.

90 seen

or

[88°, 92°] drawn on pie chart allow missing or incorrect label

20

60 × 360 or 120 seen oe eg 360 ÷ 3

or

[118°, 122°] drawn on pie chart	
allow missing or incorrect label	
	M1

Fully correct pie chart with unambiguous labels and all angles ±2°

A1

M1

[3]

Additional Guidance

All three labels (or a key) needed for the A1 but accept eg No, Yes, Rest or N, Y, M or N, Y, R

eg for No do not accept 15 (people) or $\overline{4}$ or 90 as the label

Not using the given radius will score a maximum of M2

[3]