MS RE4

GCSE Mathematics Practice Tests: Set 6

Paper 2F (Calculator)

Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

ALWAYS LEARNING PEARSON

Answer ALL questions.
Write your answers in the spaces provided.
You must write down all the stages in your working.

Converting FDP

1. Write 0.5 as a fraction.

$= \frac{1}{2}$

USE YOUR CALCULATOR

$\frac{1}{2}$

.....

(Total 1 mark)

Converting FDP

2. Write $\frac{17}{100}$ as a decimal.

$= 0.17$

USE YOUR CALCULATOR

0.17

.....

(Total 1 mark)

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3. Write 40 out of 50 as a fraction.
Give your fraction in its simplest form.

"40 out of 50" | $\frac{40}{50}$

Simplify: $(\div 10)$ | $= \frac{4}{5}$

$\frac{4}{5}$

.....

(Total 2 marks)

Fractions of an amount

4. Work out $\frac{3}{4}$ of 24

$= \frac{3}{4} \times 24$ USE YOUR CALCULATOR

$= 18$

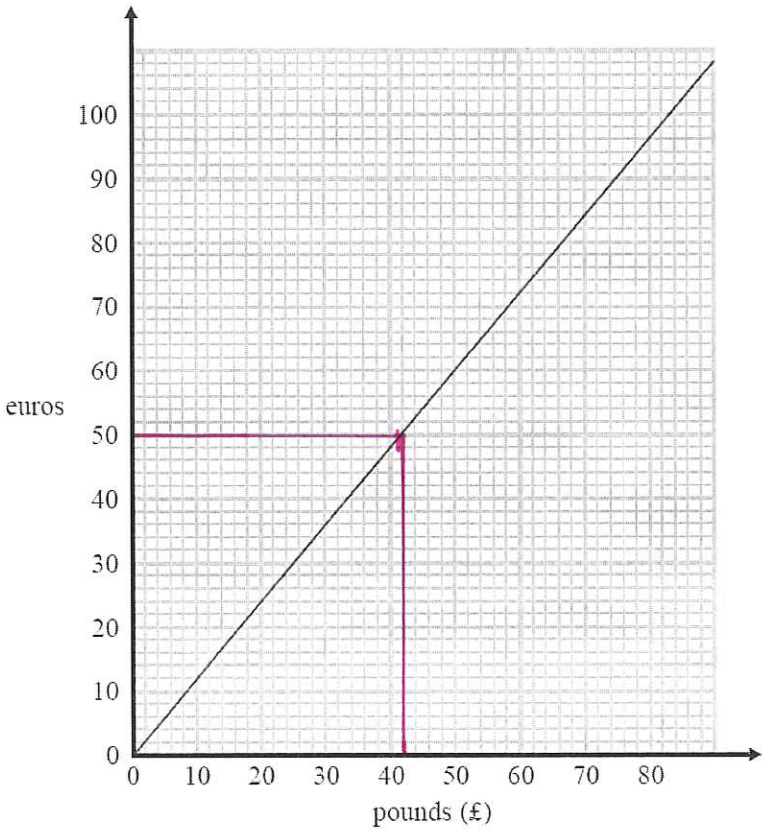
18

.....

(Total 2 marks)

Conversion Graphs

5. You can use this conversion graph to change between pounds (£) and euros.



Change 150 euros into pounds (£).

No measure for €150 but pick €75 and x2
or €50 and x3 etc...

USE GRAPH (x3)

€50 = £42

€150 = £126

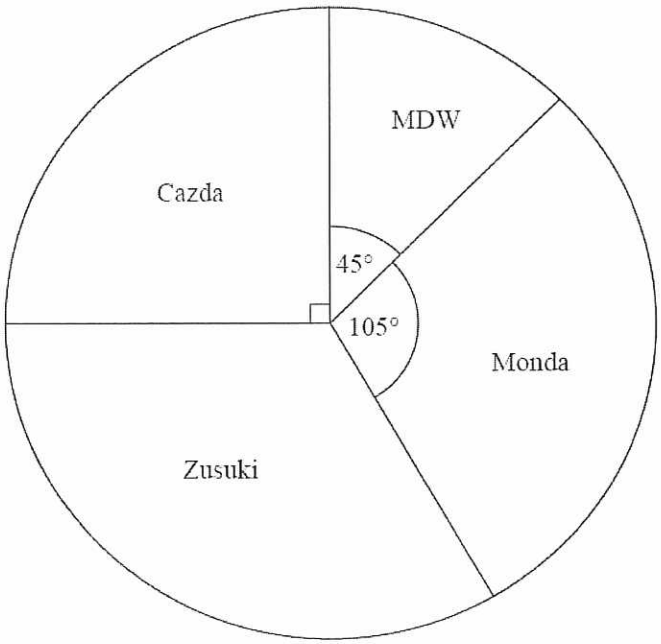
£ 126

(Total 2 marks)

Pie Charts

6. Some drivers are asked which make of car they like best.

The pie chart and table show some information about their answers.



Complete the table.

Make of car	Number of drivers	Angle of sector
MDW	18	45°
Cazda	36	90°
Zusuki	48	120°
Monda	42	105°

(÷18) 18 frequency = 45°
1 frequency = 2·5°
(×48) 48 frequency = 120°

1 frequency = 2·5°
42 frequency = 105° (÷42)

(105° ÷ 2·5° = 42)

(Total 4 marks)

Best Buy

7. Jane wants to buy some compost.
Both Suttons Shop and Greens Garden Shop sell compost.

Jane needs 140 litres of compost.
She wants to buy all the compost from the same shop.
She wants to buy the compost as cheaply as possible.

Which shop should Jane buy the compost from?
You must show all your working.

Suttons

140L ÷ 20L = 7 ∴ 7 bags needed

7 bags cheapest
= 3 2x bags
+ 1 1x bag
= (3 x £3.25) + (1 x £2.25)
= £12

Greens

140L ÷ 70L = 2 ∴ 2 bags needed

2 x £4.99 = £9.98

∴ Greens is the place for Jane to buy compost.

(Total 4 marks)

Timetables

8. David drives to the supermarket on his way home from work.

The table shows some information about his journey.

	Time
Leaves work	1730
Gets to supermarket	1745
Leaves supermarket	1810

+15 = 1800
+10 = 1810
25 mins

(*a*) How many minutes is David at the supermarket?

25 ..... minutes
(1)

David leaves the supermarket at 1810.
He drives 20 miles to his home.
The speed limit for the journey is 30 mph.

David drives within the speed limit.

(*b*) Can David get home before 1900?
Give reasons for your answer.

Speed Distance Time

S = 30mph
D = 20 miles
T = ?

$T = \frac{D}{S}$

D = 20miles
S = 30mph

$\therefore T = \frac{20 \text{ miles}}{30 \text{ mph}}$

$= \frac{2}{3}$ hour = 40 minutes

left at 18:10

18:10 + 40 minutes = 18:50

Conclusion

Yes David can get home before 19:00.

(3)

(Total 4 marks)

Substitution

9. $a = 4b$

(*a*) Work out the value of a when $b = 3$.

$a = 4(3)$

$a = 12$

$a =$ 12

(1)

$P = 4d - 3$

(*b*) Work out the value of P when $d = 2$.

$P = 4(2) - 3$

$P = 8 - 3$

$P = 5$

$P =$ 5

(2)

(Total 3 marks)

---

10. Here are the first five terms of a number sequence.

Linear sequences

17 21 25 29 33 37 41

(+4 +4 +4 +4 +4 +4)

(*a*) Write down the next two terms of the sequence.

37 , 41

(2)

(*b*) Explain how you found your terms.

Added 4 each time

(1)

(*c*) Work out the 12th term of the sequence.

Term	7	8	9	10	11	12
	41	45	49	53	57	61

(+4 +4 +4 +4 +4)

61

(1)

(*d*) Explain why 70 is not a term of this sequence.

Because keep adding 4. 61+4=65 65+4=69

69+4=73. 70 is missed.

(1)

(Total 5 marks)

Unitary Method

11. Julie buys 19 identical calculators.
The total cost is £143.64

Work out the total cost of 31 of these calculators.

£143.64 = 19 calculators
(÷19) £7.56 = 1 calculator
(x31) £234.36 = 31 calculators

£ 234.36

(Total 3 marks)

Money problems

12. When you buy something from Quickmart you get points.

Smart Phone	DVDs	Lawnmower
£419	£8.99 each	Basic £57 Electric £81
get 838 points	get 16 points for each DVD you buy	get 12 points for every £3 you spend

Chantal buys a Smart Phone, 4 DVDs and a basic lawnmower from Quickmart.

(a) Work out how many points she gets.

Smart phone | 838 points
DVDs | 16×4 = 64 points
Lawnmower | £57 ÷ £3 = 19 ∴ 19 sets of 12 points. 19×12 = 228 points
Total Points | 838+64+228 = 1130 ..... points

(3)

You can get money off the cost of your shopping at Quickmart.

Get £2.40 off the cost of your shopping for every 500 points

Louis has 4500 points.

He wants to get a DVD player costing £22
He wants to use his points to get the DVD player.

(b) Does Louis have enough points to get the DVD player?

Discount in points | 4500 ÷ 500 = 9 lots of discount
9 × £2.40 = £21.60
Conclusion | No he does not since he has £21.60 worth of points

(4)

(Total 7 marks)

Frequency Polygons

13. The table shows some information about the ages of 60 teachers.

Age (a years)		Frequency
$20 < a \leq 30$	25	6
$30 < a \leq 40$	35	16
$40 < a \leq 50$	45	14
$50 < a \leq 60$	55	22
$60 < a \leq 70$	65	2

(a) Write down the modal class interval.

↓ Highest Frequency

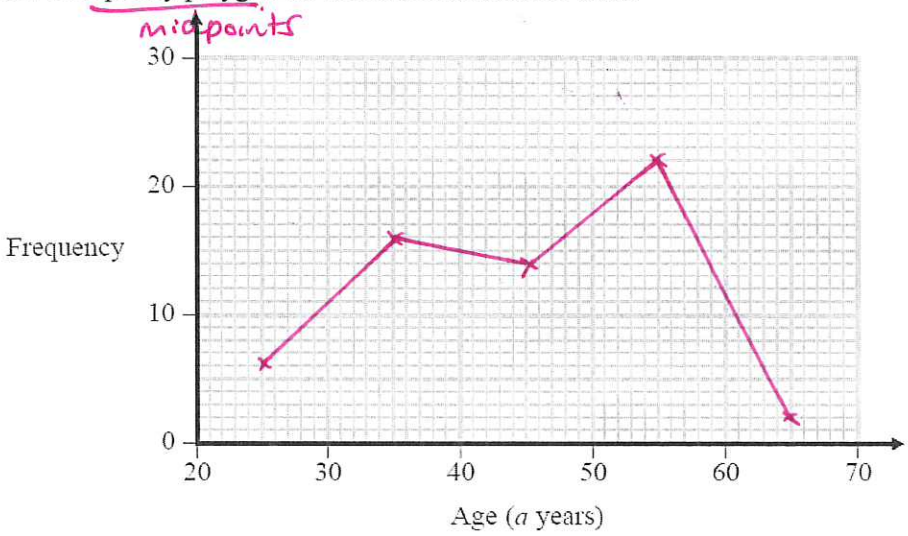
$50 < a \leq 60$

.....

(1)

(b) Draw a frequency polygon for the information in the table.

midpoints



(2)

(Total 3 marks)

Two way Tables

14. Sal asked 60 adults if they liked Chinese food best or Italian food best or Thai food best.

29 of the adults were women.
6 of the women liked Thai food best.
10 of the men liked Chinese food best.
8 of the 13 adults who liked Italian food best were women.

Work out the number of men who liked Thai food best.

	Chinese	Italian	Thai	Total
Male	(4) = 10	(7) = 5	(9) = 16	(8) = 31
Female		(6) = 8	(3) = 6	(2) = 29
Total		(5) = 13		(1) = 60

(7) $13 - 8 = 5$

(8) $60 - 29 = 31$

(9) $31 - 10 - 5 = 16$

16

.....

(Total 4 marks)

DIY Maths
Area of 2D Shapes

15. The diagram shows a path around a pond.

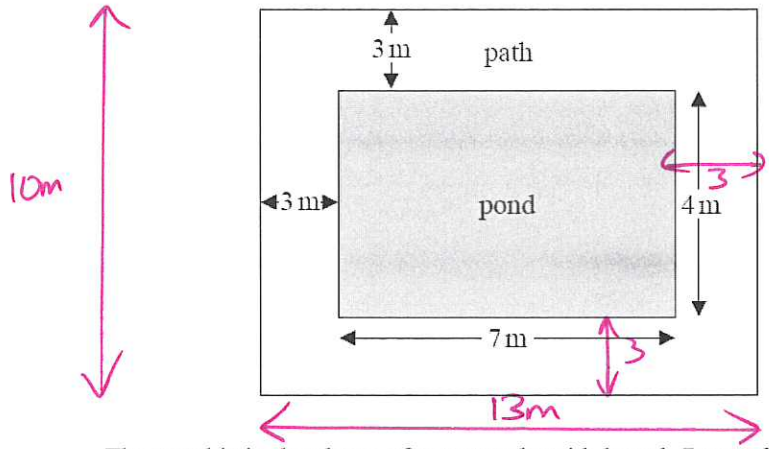


Diagram **NOT** accurately drawn

The pond is in the shape of a rectangle with length 7 m and width 4 m.
The path is 3 m wide.

Ali is going to cover the path with gravel.
One bag of gravel will cover 10 m^2 of the path.

How many bags of gravel does Ali need to buy?
You must show your working.

Area of pond: $7m \times 4m = 28m^2$

Area of Path and Pond (Big Rectangle): $13m \times 10m = 130m^2$

Area Path = Total − Area Pond: Area Path = $130m^2 - 28m^2 = 102m^2$

Bags of Gravel: $102m^2 \div 10m^2 = 10.2$ bags of gravel

Conclusion: ∴ He needs 11 bags

..... bags

(Total 4 marks)

Single Event Probability

16.

likely	impossible	certain	evens	unlikely

(*a*) Use a word from the box which best describes the probability of each of the following events.

(i) When you throw an ordinary coin you get a tail.

"1 out of 2" = $\frac{1}{2}$ ..... Evens .....

(ii) When you throw an ordinary dice you get a number less than 7.

Must happen! ..... Certain .....

(2)

Bill has some counters in a bag.

3 of the counters are red.
7 of the counters are blue.
The rest of the counters are yellow. ⟶ x yellow counters

Bill takes at random a counter from the bag.

The probability that he takes a yellow counter is $\frac{2}{7}$. Proportion

(*b*) How many yellow counters are in the bag before Bill takes a counter?

Total counters "OUT OF" | $3+7+x = 10+x$

$10+x$ must be a multiple of 7 since the denominator of the probability of yellow = 7

$\therefore$ Try $10+x = 14$ $\therefore x = 4$.

Yellow = $\frac{4}{14}$ | $\frac{4}{14} = \frac{2}{7}$. Correct $\therefore$ 4 yellow counters.

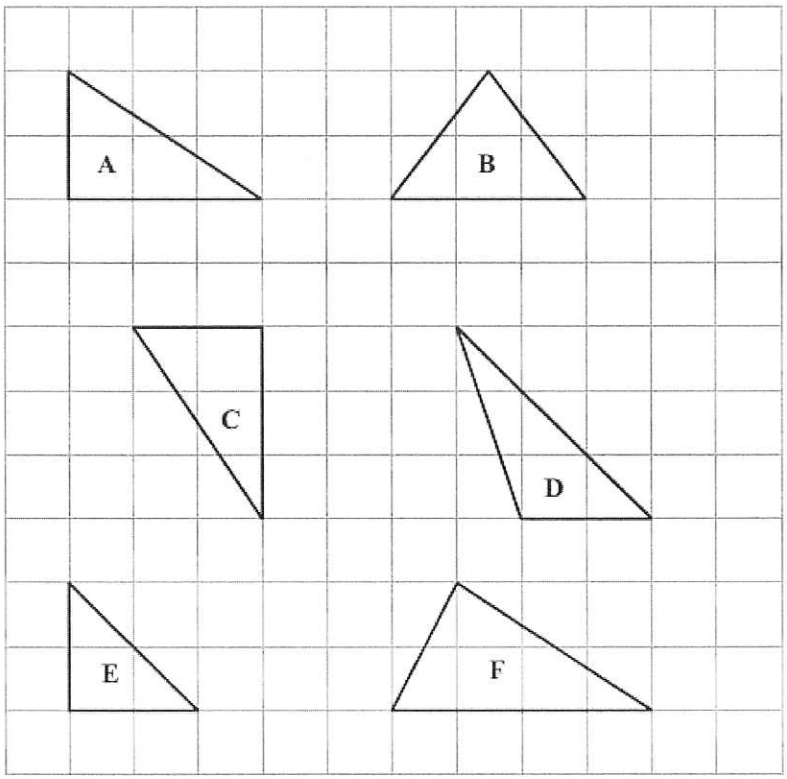
..... 4. .....

(2)

(Total 4 marks)

congruency and 2D Shapes

17. Here are 6 triangles drawn on a grid of centimetre squares.



(a) Write down the letters of the two congruent triangles.

A and C

.....

(1)

(b) Write down the letter of an isosceles triangle.

B

.....

(1)

(c) Find the area of triangle **E**.

Area = $\frac{b \times h}{2}$ | $A = \frac{2 \times 2}{2} = 2\text{cm}^2$

2 ..... cm^2

(1)

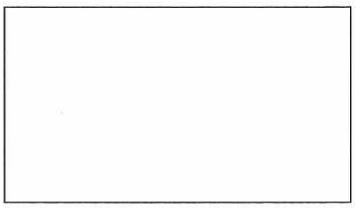
(Total 3 marks)

Similar Shapes

18. A small photograph has a length of 6 cm and a width of 5 cm.
The small photograph is enlarged to make a large photograph.

The large photograph has a length of 21 cm.

Small photograph



×3.5 →

Large photograph

The two photographs are similar rectangles.

Work out the perimeter of the large photograph.

Scale factor

21cm ÷ 6cm = 3.5

width (large)

5 cm × 3.5 = 17.5cm

P = 21cm + 21cm + 17.5cm + 17.5cm

P = 42cm + 35cm

P = 77cm

77 ..... cm

(Total 3 marks)

Forming and Solving Equations

19. Ann has some cards.

Beth has 4 cards more than Ann.
Cath has three times as many cards as Beth.
The total number of cards is 51

How many cards does each of the three people have?
You must show all your working.

Ann = x
Beth = x + 4
Cath = 3(x+4)

Total = Ann + Beth + Cath

$51 = x + x+4 + 3(x+4)$

expand $51 = x + x+4 + 3x+12$

collect $51 = 5x+16$

(−16) $35 = 5x$

(÷5) $7 = x$

Ann = x $x = 7$ ∴ Ann = 7

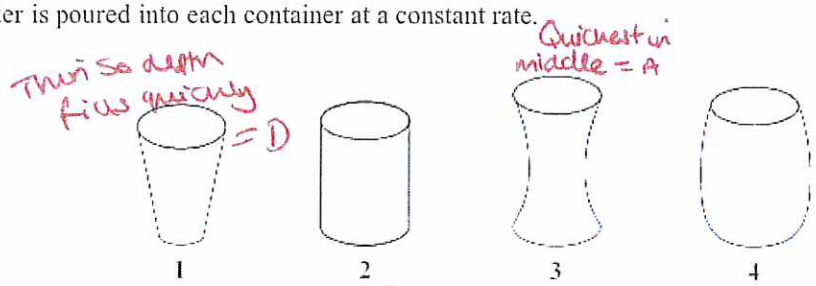
Beth = x+4 $7+4 = 11$ ∴ Beth = 11

Cath = 3(x+4) $3 \times 11 = 33$ ∴ Cath = 33

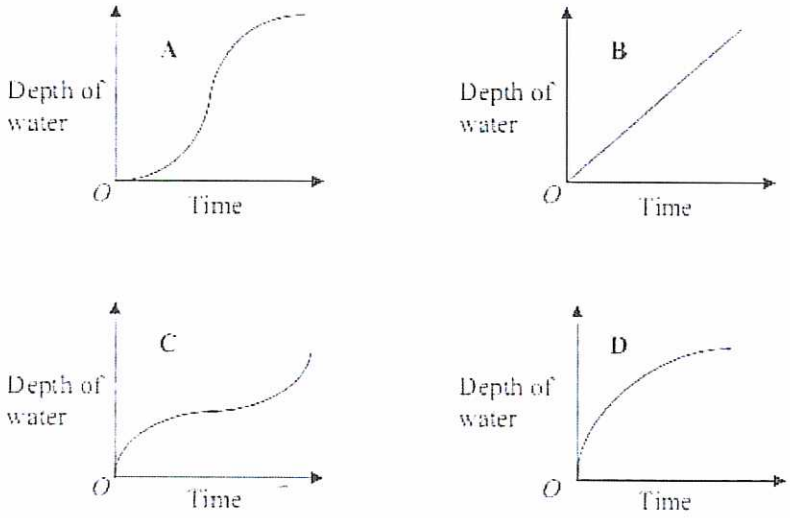
(Total 5 marks)

Real life Graphs

3. Here are four containers.
Water is poured into each container at a constant rate.



Here are four graphs.
The graphs show how the depth of the water in each container changes with time.



Match each graph with the correct container.

A and 3

B and 2

C and 4

D and 1

(Total 2 marks)

OR Probability Rule

21. A factory makes metal bottle tops.

When a bottle top is too big or too small it does not fit the bottle.

means (+)

The probability that a bottle top is too big is 0.008
The probability that a bottle top is too small is 0.015

A bottle top is taken at random.

Work out the probability that the bottle top **does** fit the bottle.

$P(\text{doesn't fit}) = P(\text{Too big}) + P(\text{Too small})$

$= 0.008 + 0.015$

$= 0.023$

$P(A') = 1 - P(A)$

$\therefore P(\text{does fit}) = 1 - 0.023$

$= 0.977$

0.977

.....

(Total 2 marks)

Pythagoras / SOHCAHTOA with bearings

4. The diagram shows the positions of three turbines A, B and C.

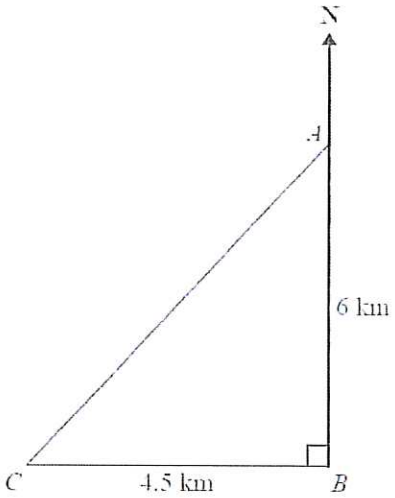


Diagram NOT accurately drawn

A is 6 km due north of turbine B.
C is 4.5 km due west of turbine B.

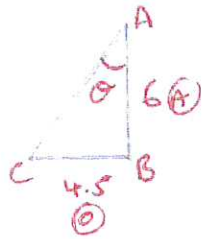
(a) Calculate the distance AC.

Pythagoras | $a^2+b^2=c^2$
$6^2+4.5^2=56.25=c^2$
$\sqrt{ANS}$ | $7.5=c$

7.5 ..... km
(3)

(b) Calculate the bearing of C from A.
Give your answer correct to the nearest degree.

Bearing $=180^\circ+\theta^\circ$...



shift tan

Bearing $=180^\circ+\theta^\circ$

SOHCAHTOA

$\tan\theta=\frac{O}{A}$

$\tan\theta=\frac{4.5}{6}$

$\theta=36.869..=ANS$

Bearing $=180+ANS$
$=217$ (nearest degree)

217 °
(4)
(Total 7 marks)

Missing Mean

23. A rugby team played six games.
The mean score for the six games is 14.5

The rugby team played one more game.
The mean score for all seven games is 16

Work out the number of points the team scored in the seventh game.

first 6 games total | $6 \times 14.5 = 87$

mean of seven games formula ($=16$) | $\frac{87+x}{7} = 16$

$(\times 7)$ | $87+x = 112$

(-87) | $x = 25$

25 ..... points

(Total 2 marks)

Angles in Polygons

24. *ABCDE* and *PQRST* are regular pentagons.

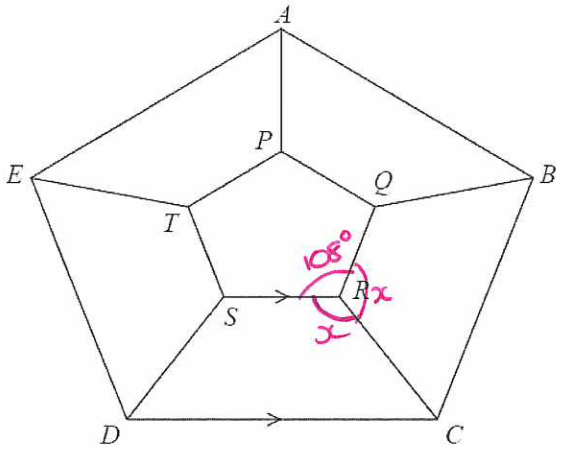


Diagram **NOT** accurately drawn

SR is parallel to *DC*
AP = *BQ* = *CR* = *DS* = *ET*

Work out the size of angle *SRC*.
You must show all your working.

$S\hat{R}Q = 108°$

Let $S\hat{R}C = C\hat{R}B = x°$

$x° + x° + 108° = 360°$

$2x + 108° = 360°$

$2x° = 252°$

$x = 126°$

Interior angles of polygon $= (n-2) \times 180 = (5-2) \times 180 = 540$
$(540 \div 5 = 108°)$

Angles around a point $= 360°$

Collect

$(-108°)$

$(\div 2)$

126 .....°

(Total 3 marks)

TOTAL FOR PAPER IS 80 MARKS