

GCSE Mathematics

Practice Tests: Set 1

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.

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.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. Write down the value of the 9 in 213.95

Place Value

9 tenths ($= \frac{9}{10}$)

(Total 1 mark)

2. Write these numbers in order of size.
Start with the smallest number.

Ordering Decimals

0.74 0.744 0.704 0.7 0.07

④ 0.740
⑤ 0.744
③ 0.704
② 0.700
① 0.070

0.070, 0.700, 0.704, 0.740, 0.744

(Total 1 mark)

3. Simplify $3 \times g \times 5 \times h$

Simplifying Algebraic Expressions

$$\begin{aligned} &= 15 \times g \times h \\ &= \underline{\underline{15gh}} \end{aligned}$$

15gh

(Total 1 mark)

4. Work out $5.9 + 3.17^2$

Calculator Skills

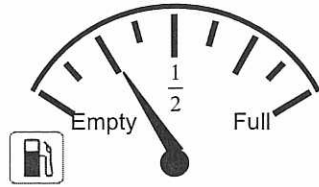
USE YOUR CALCULATOR

15.9489.

(Total 1 mark)

Reading Scales

5. A petrol tank holds 48 litres of petrol when it is full.



The scale shows information about how much petrol there is in the petrol tank.

Work out the number of litres of petrol in the petrol tank.

$$\text{Tank} = \frac{1}{4} \text{ full} \quad \left| \quad \begin{array}{l} 48 \text{ litres} = \text{full} \\ \frac{1}{4} \text{ of } 48 = \frac{1}{4} \times 48 = \underline{\underline{12}} \end{array} \right. \quad \dots\dots\dots 12 \text{ litres}$$

(Total 2 marks)

Pictograms and Tally Charts

6. The tally chart shows information about the numbers of text messages sent by some students last week.

Name of student	Tally	Frequency
Anna		24
Bhavini		12
Cassie		15
David		9

- (i) Complete the frequency column.

The pictogram shows the numbers of text messages sent by Anna and Cassie.

Anna	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>6 squares = 24 frequency \therefore 1 square = 4 frequency</p>
Bhavini	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Cassie	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>\leftarrow 12 frequency = 3 squares</p> <p>$\frac{1}{4}$ of square = 1</p>
David	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Key: = 4 texts

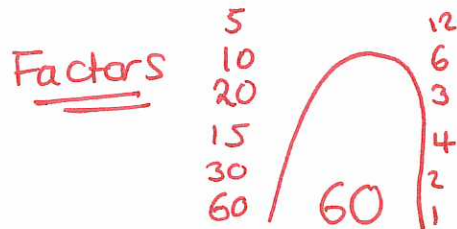
- (ii) Complete the pictogram and the key.

(Total 5 marks)

Factors

7. Michael writes down 4 different factors of 60
He adds the 4 factors together.
He gets a number greater than 20 but less than 35

What 4 factors could Michael have written down?



Choose 4

..... 1 2 3 20

(Total 3 marks)

8. Asif was asked to solve the equation $8x + 1 = 5$

Solving Equations

Here is his working.

	$8x + 1 = 5$
(-1)	$8x = 4$ ✓
$(\div 8)$	$x = \frac{8}{4}$ ✗
	$x = 2$

Asif's answer is wrong.
What mistake did he make?

..... He has said $x = \frac{8}{4}$ but this should read
..... $x = \frac{4}{8}$ since he has divided by 8.

(Total 1 mark)

Adding / Subtracting Money

9. On 1st June, Brian has £312 in his bank account.

On 5th June he puts £120 into his bank account.

On 10th June he puts £25 into his bank account.

This is how much Brian spends from his bank account from 1st June to 15th June.

Supermarket £42.40
Mobile phone bill £21.05
Grocery shop £24.30
Electricity bill £64.20
Online book purchase £18.32
Council tax £144.50
Clothes £84.20
Supermarket £51.35

On 16th June, Brian wants to know how much money there is in his bank account.

Work out how much money there is in his bank account.

<u>Total in bank</u>	$£312 + £120 + £25 = £457$
<u>money spent:</u>	$£42.40 + £21.05 + £24.30 + £64.20 + £18.32 + £144.50 + £84.20 + £51.35$
USE YOUR CALCULATOR	$= £450.32$
<u>money left:</u>	$£457 - £450.32 = £6.68$

£ 6.68

(Total 4 marks)

Negative Numbers

10. Jim says,

“When you subtract a number from 10, the answer will always be less than 10”

(a) Is Jim correct?

You must give a reason with your answer.

No. E.g: $10 - (-1) = \underline{\underline{11}}$, and $11 > 10$.

(1)

Lucy says,

Multiples of 2

“When you halve a whole number that ends in 4, you always get a number that ends in 2”

(b) Write down an example to show that Lucy is wrong.

$14 \div 2 = 7$. This is NOT 2.

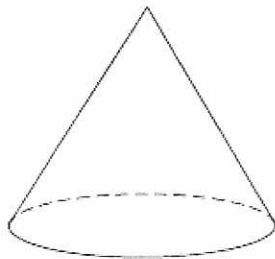
(1)

(Total 2 marks)

11. Write down the name of each of these two 3-D shapes.

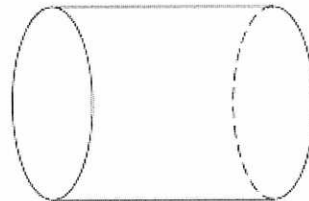
3D Shape Properties

(i)



(i) Cone

(ii)



(ii) Cylinder

(Total 2 marks)

Using Formula

12. George and Harry work in a factory.

They use this rule to calculate their total pay in pounds.

$$\text{Total pay} = 8 \times \text{number of hours worked} + \text{bonus}$$

George worked 30 hours.
He was paid a bonus of £20

- (a) Work out George's total pay.

$$\begin{array}{l|l} \text{Total pay} & = 8 \times \cancel{30} + \cancel{20} \\ & = \underline{\underline{260}} \end{array} \quad \text{£ } \underline{\underline{260}} \quad \dots\dots\dots (2)$$

Harry worked 34 hours.
His total pay was £300

- (b) Work out the bonus that Harry was paid.

$$\begin{array}{l|l} \text{Total pay} & \text{Total pay} = 8 \times \text{Number of hours} + \text{Bonus} \\ & \cancel{£300} = 8 \times \cancel{£34} \quad \quad \quad + \text{Bonus} \\ & \cancel{£300} = \cancel{£272} \quad \quad \quad + \text{Bonus} \\ & \underline{\underline{£28}} = \underline{\underline{28}} \quad \quad \quad \text{Bonus} \end{array} \quad \text{£ } \underline{\underline{28}} \quad \dots\dots\dots (3)$$

(Total for Question 12 is 5 marks)

Percentages

13. Trina collects eggs from her hens.
She labels their eggs small or medium or large.

20% of the eggs she collected in May were small.
24% of the eggs she collected in May were large.

- (a) What percentage of the eggs she collected in May were medium?

$$\text{Total \%} = 100\% \quad | \quad 100\% - 20\% - 24\% = 56\%$$

.....%
56
(2)

- (b) Express 24% as a fraction.
Give your fraction in its simplest form.

% = "out of 100"

$$24\% = \frac{24}{100}$$

Simplify

$$= \frac{12}{50} = \frac{6}{25}$$

USE YOUR CALCULATOR

.....
 $\frac{6}{25}$
(2)

Tina collected 75 eggs in May.

- (c) Work out 20% of 75.

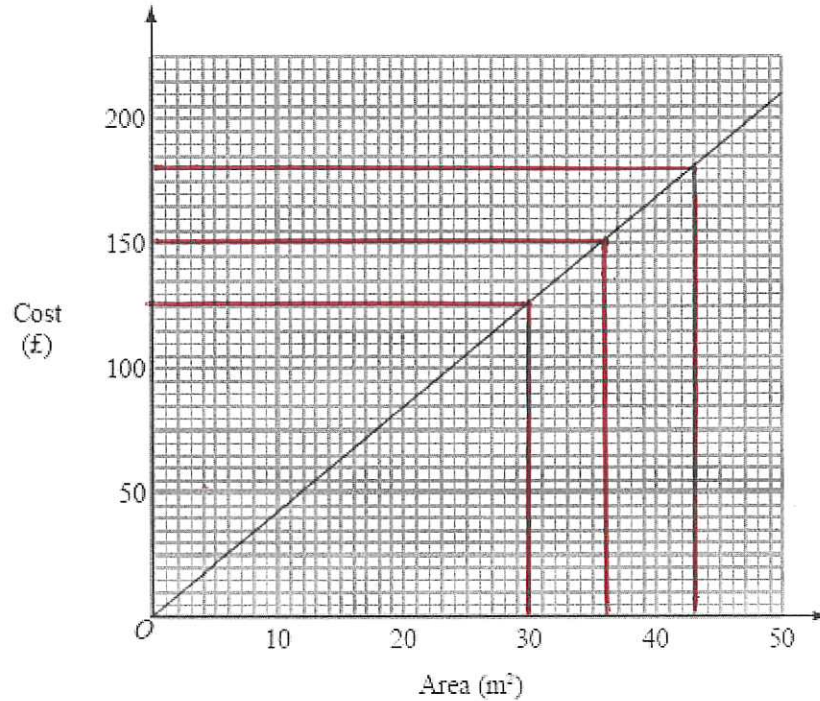
$$\begin{array}{l|l} & 100\% = 75 \\ (\div 10) & 10\% = 7.50 \\ (\times 2) & 20\% = 15.00 \end{array}$$

.....
15
(2)

(Total 6 marks)

Interpreting Real Life Graphs

14. John cleans carpets of different areas.
He uses this graph to work out the cost of cleaning a carpet.



A carpet has an area of 30 m^2 .

- (a) Use the graph to find the cost of cleaning this carpet.

£ 125 (1)

It costs £150 to clean another carpet.

- (b) Use the graph to find the area of this carpet.

..... 36 m^2 (1)

A rectangular carpet has a length of 8.6 m.
It has a width of 5 m.

- (c) Work out the cost of cleaning this carpet.

$$\text{Area} = L \times W \quad | \quad 8.6\text{m} \times 5\text{m} = 43\text{m}^2$$

USE THE GRAPH: 43m^2 | = £180

£ 180 (3)

(Total 5 marks)

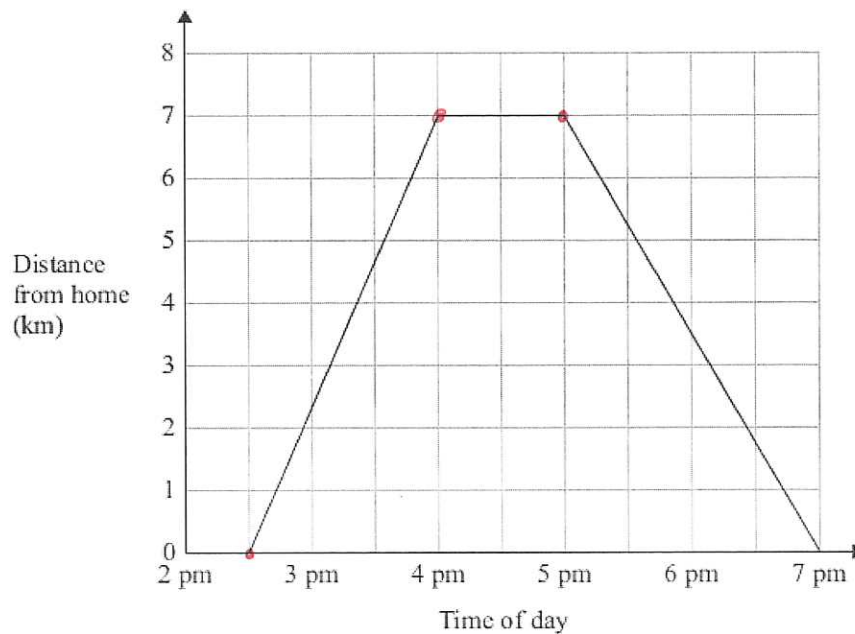
Distance Time (Travel) Graphs

15. Suha walked 7 km from her home.

She then had a rest.

Suha then walked home.

Here is Suha's travel graph.



(a) What time did Suha leave home?

2:30pm
.....
(1)

(b) How long did Suha rest for?

Between 4pm and 5pm

1 hour
.....
(1)

(c) What time did Suha start to walk home?

5pm
.....
(1)

(d) Work out the total time that Suha was away from home.

2:30pm until 7pm

Difference = 4 hours 30 mins
= 4.5 hours

4.5
..... hours
(1)

(Total 4 marks)

Area and Perimeter of Rectangles

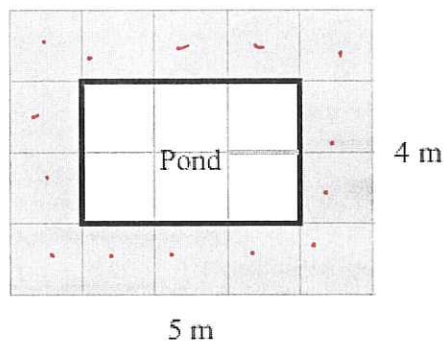
16. Priyesh has 12 square paving stones.
He will use all the stones to make a patio that is a rectangle.

- (a) Draw a diagram to show how Priyesh can use these stones to make a patio that is a rectangle.
3x4 or 6x2 or 12x1



(2)

The diagram shows a pond with a path around it.



- (b) (i) Work out the perimeter of the pond.

$$\begin{aligned} \text{Perimeter} &= 4\text{m} + 5\text{m} + 4\text{m} + 5\text{m} \\ &= 18\text{m} \end{aligned}$$

WRONG

X

This is the path

$$\begin{aligned} \text{Perimeter} &= 2\text{m} + 3\text{m} + 2\text{m} + 3\text{m} \\ &= \underline{\underline{10\text{m}}} \end{aligned}$$

..... m

- (ii) Work out the area of the path.

$$\text{COUNT THE } 1\text{cm}^2 \text{ SQUARES} = 14 \text{cm}^2$$

14m²

(3)

(Total 5 marks)

Worded Multiplication and Division

17. A machine makes 36 trophies every hour.

The machine makes trophies for $8\frac{1}{2}$ hours each day, on 5 days of the week.

The trophies are packed into boxes.
Each box holds 8 trophies.

How many boxes are needed for all the trophies made each week?

Trophies per day: $8\frac{1}{2} \times 36 = 306$

Trophies per week: $306 \times 5 = 1530$

Boxes Needed $1530 \div 8 = 0191.25$
 $8 \overline{)1530}$

Remember to just

USE YOUR CALCULATOR

Conclusion

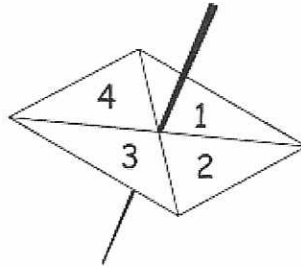
$\therefore 192$ boxes are needed.

192

(Total 4 marks)

Sum of Probabilities

18. Here is a four-sided spinner.
The spinner is biased.



The table shows the probabilities that the spinner will land on 1 or on 3

Number	1	2	3	4
Probability	0.2	x	0.1	x

The probability that the spinner will land on 2 is the same as the probability that the spinner will land on 4

- (a) Work out the probability that the spinner will land on 4

$$\begin{array}{l|l}
 \text{Sum of probability} = 1 & 0.2 + x + 0.1 + x = 1 \\
 \text{collect} & 0.3 + 2x = 1 \\
 (-0.3) & 2x = 0.7 \\
 (\div 2) & x = 0.35 \\
 & \underline{\underline{0.35}}
 \end{array}$$

(3)

Shunya is going to spin the spinner 200 times.

Relative Frequency

- (b) Work out an estimate for the number of times the spinner will land on 3

$$\begin{array}{l|l}
 P(\text{land on 3}) = 0.1 & 200 \times 0.1 \\
 & = \underline{\underline{20}}
 \end{array}$$

20

(2)

(Total 5 marks)

Converting Currency

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. Eric travels from the UK to India every year.

In 2010, the exchange rate was £1 = 67.1 rupees.

In 2012, the exchange rate was £1 = 82.5 rupees.

In 2010 Eric changed £600 into rupees.

How many pounds (£) did Eric have to change to rupees in 2012 to get the same number of rupees as he did in 2010?

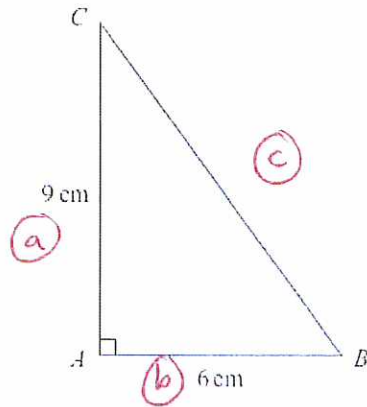
2010	£1 : 67.1r		
(x600)	£600 : 40260r		
2012	£1 : 82.5r		
(x488)	£488 : 40260r	↑ ÷488	40260 ÷ 82.5 = 488

£ 488

(Total 3 marks)

Pythagoras

3.



ABC is a right-angled triangle.
 $AB = 6$ cm.
 $AC = 9$ cm.

Work out the length of BC .
Give your answer correct to 3 significant figures.

Pythagoras

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

$$(6)^2 + (9)^2 = c^2$$

$$36 + 81 = c^2$$

$$117 = c^2$$

$\sqrt{\text{ANS}}$

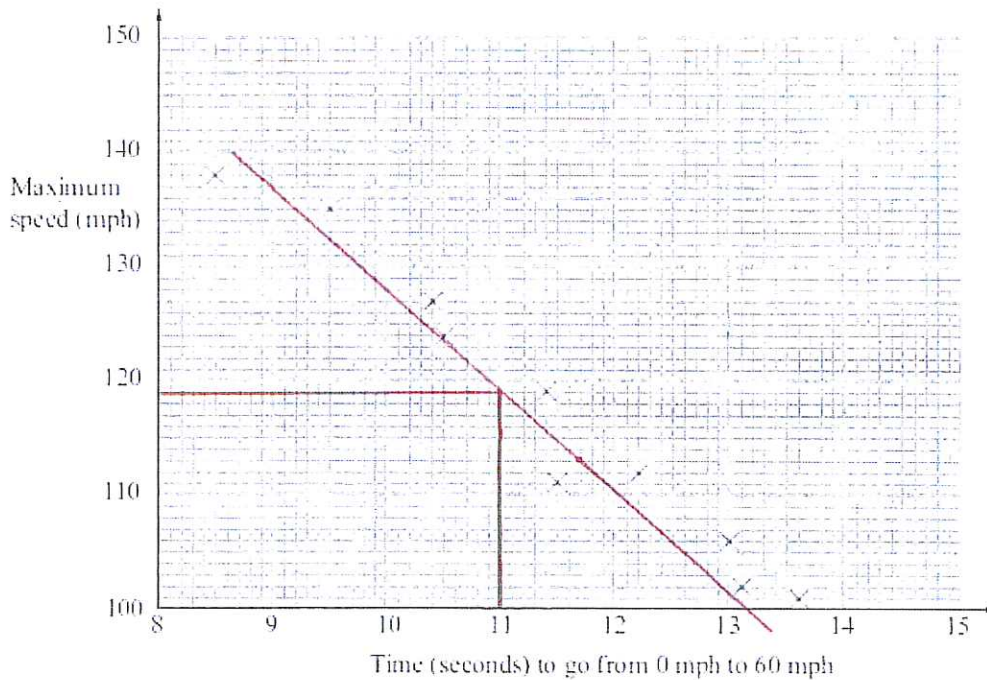
$$10.8 = c \text{ (3 s.f.)}$$

..... 10.8 cm

(Total 3 marks)

Scatter Graphs

4. The scatter graph shows some information about 10 cars.
It shows the time, in seconds, it takes each car to go from 0 mph to 60 mph.
For each car, it also shows the maximum speed, in mph.



- (a) What type of correlation does this scatter graph show?

Negative

(1)

The time a car takes to go from 0 mph to 60 mph is 11 seconds.

- (b) Estimate the maximum speed for this car.

USE THE GRAPH

119 mph
(2)

(Total 3 marks)

LCM in Context

2. Ali is planning a party.
 He wants to buy some cakes and some sausage rolls.
 The cakes are sold in boxes.
 There are 12 cakes in each box.
 Each box of cakes costs £2.50.
 The sausage rolls are sold in packs.
 There are 8 sausage rolls in each pack.
 Each pack of sausage rolls costs £1.20.
 Ali wants to buy more than 60 cakes and more than 60 sausage rolls.
 He wants to buy exactly the same number of cakes as sausage rolls.
 What is the least amount of money Ali will have to pay?

Must buy same
 amount greater than 60
 \therefore LCM

8: 8 16 24 32 40 48 56 64 72

12: 12 24 36 48 60 72

LCM = 72

72 cakes cost

$72 \div 12 = 6$ packs

$6 \times \pounds 2.50 = \pounds 15$

72 sausages cost

$72 \div 8 = 9$ packs

$9 \times \pounds 1.20 = \pounds 10.80$

Total cost

$\pounds 15 + \pounds 10.80 = \pounds 25.80$

£ 25.80.....

(Total 5 marks)

Prime Numbers Sequences

23. The n th term of a sequence is $n^2 + 4$

Alex says

“The n th term of the sequence is always a prime number when n is an odd number.”

Alex is wrong.

Give an example to show that Alex is wrong.

Try $n=1$: $(1)^2 + 4 = 5$ ✓ Prime
 $n=2$: $(2)^2 + 4 = 8$ ✗ Not Prime
 ↗
 But n must be odd!
 $n=3$: $(3)^2 + 4 = 13$ ✓ Prime
 $n=5$: $(5)^2 + 4 = 29$ ✓ Prime
 $n=7$: $(7)^2 + 4 = 53$ ✓ Prime
 $n=9$: $(9)^2 + 4 = \underline{85}$ ✗ Not Prime!
 (Total 2 marks)

24. Solve $x + 2y = 3$ ①

$x - y = 6$ ②

Simultaneous Equations

Same Take Opposite Plus
 $2y - -y = 3y$

① - ②

(÷3)

$3y = -3$

$y = -1$

Put in ① :

$x + 2y = 3$

$x + 2(-1) = 3$

$x - 2 = 3$

(+2)

$x = 5$

$x = \underline{5}$

$y = \underline{-1}$

(Total 3 marks)

Sharing Ratio

25. Colin, Dave and Emma share some money.

Colin gets $\frac{3}{10}$ of the money.

E:D

Emma and Dave share the rest of the money in the ratio 3 : 2.

What is Dave's share of the money?

$$\text{Total} = 100\%$$

$$\text{Colin} = \frac{3}{10} = 30\%$$

$$100\% - 30\% = 70\% \text{ to share}$$

$$3 \text{ parts} + 2 \text{ parts} = 5 \text{ parts}$$

$$5 \text{ parts} = 70\%$$

$$1 \text{ part} = 14\%$$

$$2 \text{ parts} = \underline{\underline{28\%}}$$

($\div 5$)

$$\text{Dave} = 2 \text{ parts} \\ (\times 2)$$

28%

(Total 4 marks)

TOTAL FOR PAPER IS 80 MARKS