

GCSE Mathematics

Practice Tests: Set 1

Paper 3F (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 17653 correct to the nearest 1000

Th H T U
17653
↑

1
18000
(Total 1 mark)

2. Write 0.019 as a fraction.

$$0.019 = \frac{19}{1000}$$

19
1000
(Total 1 mark)

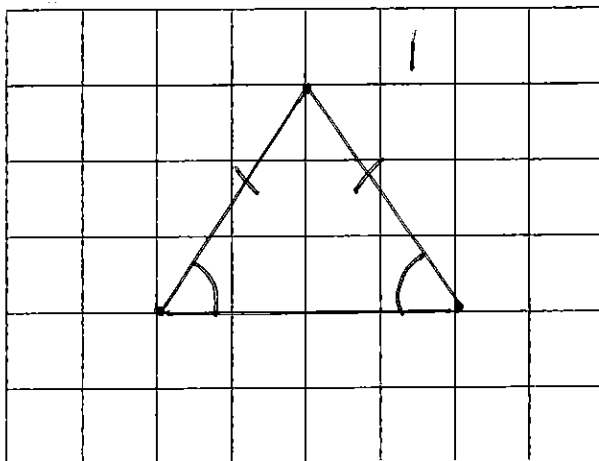
3. The probability that it will rain tomorrow is 0.65

What is the probability that it will **not** rain tomorrow?

$$\text{Probability} + \text{Not the probability} = 1$$
$$0.65 + n = 1$$

1.00
0.65
0.35
(Total 1 mark)

4. On the grid, draw an isosceles triangle.



2 angles equal
2 sides equal

(Total 1 mark)

5. Here is a list of numbers.

2

4

5

6

7

8

From the list of numbers write down

- (i) an odd number

5 or 7

- (ii) a square number

4

- (iii) a multiple of 3

6

- (iv) a factor of 10

2 or 5

(Total 4 marks)

6. A television programme started at 17 55
The programme was 1 hour 20 minutes long.

- (i) At what time did the programme end?

17 55 + 1 20 → 19 15

19 15

Mumtaz started to watch this programme at 18 34

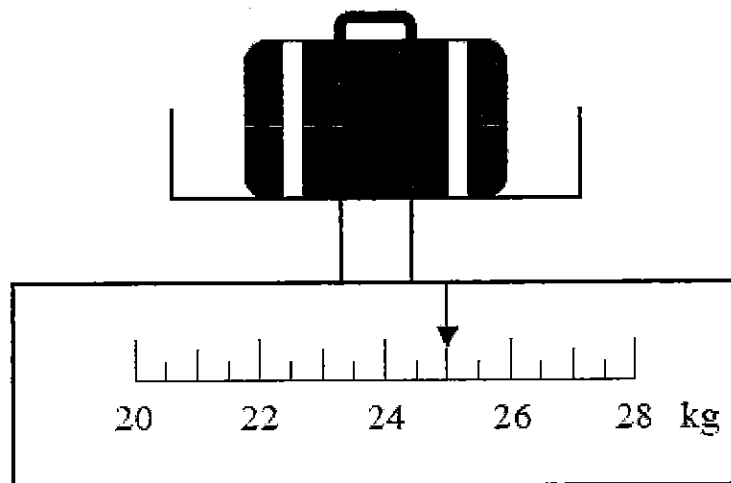
- (ii) How many minutes of the programme did Mumtaz miss?

18 34 - 17 55 → 39m

39 minutes

(Total 3 marks)

7. Keith is going to catch a plane.
He weighs his bag on some scales.



- (a) Write down the weight shown on the scales.

..... 25 kg
(1)

There is an extra charge to pay when the weight of a bag is more than 23 kg.

The weight of Grant's bag is 19.5 kg.
He does **not** want to pay the extra charge.

- (b) How much more weight can he put in the bag?

$$23 - 19.5 = 3.5$$

..... 3.5 kg
(1)

Nina has two bags.
The weight of each bag is 20 kg.

1 kg = 2.2 pounds.

- (c) What is the total weight of Nina's bags in pounds?

$$20 + 20 = 40$$

$$2.2 \times 40 = 88$$

..... 88 pounds
(3)

(Total 5 marks)

8. John works out the number of boxes of orange juice he will need for a party.
He uses this number machine.



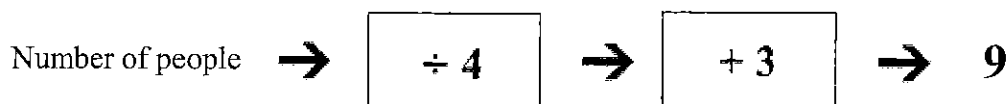
There will be 40 people at the party.

- (a) Work out the number of boxes of orange juice John needs.

$$\begin{aligned} &40 \div 4 + 3 \\ &= 10 + 3 \\ &= 13 \end{aligned}$$

$$\begin{array}{r} 13 \\ \hline (2) \end{array}$$

For a different party John needs 9 boxes of orange juice.



- (b) Work out the number of people at the party.

$$\begin{aligned} &9 - 3 \times 4 \\ &= 6 \times 4 \\ &= 24 \end{aligned}$$

$$\begin{array}{r} 24 \\ \hline (3) \end{array}$$

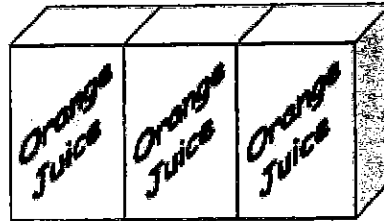
(Total 5 marks)

9. Rumana is going to take some children on a picnic.
She needs 26 cartons of orange juice.

Rumana can buy a single carton of orange juice for 38p.
She can buy a pack of 3 cartons for 90p.



single
carton
38p



3 cartons
90p

Rumana buys all the cartons she needs for the least possible amount of money.

How much did she spend?

$$26 \div 3 = 8 \text{ r } 2$$

$$8 \times 90\text{p} = 720\text{p}$$

$$2 \times 38\text{p} = 76\text{p}$$

$$720 + 76 = 796\text{p} \\ = \text{£}7.96$$

£7.96

(Total 5 marks)

10. Alan's wages are £240 each week.

He wants to save some money to buy a television.
The television costs £216

Alan is going to save 10% of his wages each week.

How many weeks will it take Alan to save enough money to buy the television?

$$10\% \text{ of } £240 \\ = £24$$

$$216 \div 24 \\ = 9$$

9 weeks

(Total 4 marks)

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

$$\begin{array}{ccccc} 70\% & \frac{2}{3} & 0.62 & \frac{13}{20} & 0.6 \\ 0.7 & 0.6 & & 0.65 & \end{array}$$

$$\frac{2}{3} \quad 0.6 \quad 0.62 \quad \frac{13}{20} \quad 70\%$$

$\frac{2}{3}, 0.6, 0.62, \frac{13}{20}, 70\%$

(Total 2 marks)

12. (a) Simplify fully

(i) $4d^2 - 6d^2 + 5d^2$

$3d^2$

(ii) $7x + 5y - 3x - 8y$

$7x - 3x = 4x$
 $5y - 8y = -3y$

$4x - 3y$

(b) Solve $6x - 5 = 16$

$6x - 5 = 16$

$6x - 5 + 5 = 16 + 5$

$6x = 21$

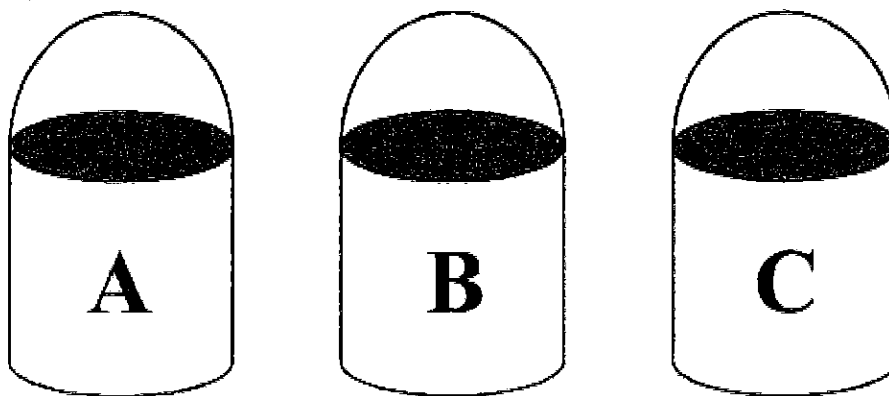
$\frac{6x}{6} = \frac{21}{6}$

$x = 3.5$

$x = 3.5$

(Total 5 marks)

13. Jason is collecting rainwater in buckets.



Buckets A, B and C are the same size.

Bucket A is $\frac{2}{3}$ full.

Bucket B is $\frac{3}{4}$ full.

Bucket C is $\frac{5}{6}$ full.

Is there enough rainwater in bucket C to pour into bucket A and B to fill them completely?
You must show all your working.

$$A \quad | \quad - \frac{2}{3} = \frac{1}{3} \quad |$$

$$B \quad | \quad - \frac{3}{4} = \frac{1}{4}$$

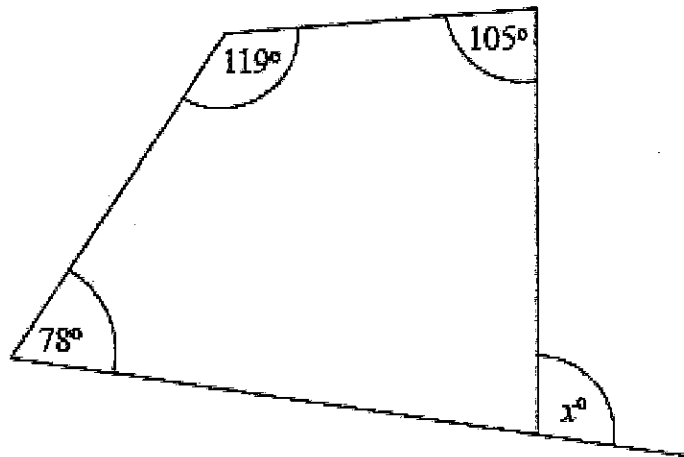
$$\frac{1}{3} + \frac{1}{4} \\ = \frac{4+3}{12} \quad |$$

$$= \frac{7}{12} \quad |$$

$$C \quad \frac{5}{6} = \frac{10}{12}, \text{ so } \frac{10}{12} > \frac{7}{12}, \text{ so C can fill A + B.}$$

(Total 4 marks)

14.



Work out the value of x .

$$119 + 105 + 78 = 302 \quad |$$

$$360 - 302 = 58 \quad | \text{ (Angles in Quad. total } 360^\circ \text{)}$$

$$180 - 58 = 122 \quad \text{ (Angles on a straight line total } 180^\circ \text{)}$$

$$x = 122^\circ \quad |$$

(Total 3 marks)

15. Peter goes for a walk.
He walks 15 miles in 6 hours.

- (a) Work out Peter's average speed.
Give your answer in miles per hour.

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$S = \frac{15}{6} \quad |$$
$$= 2.5$$

$$\begin{array}{r} | \\ \hline 2.5 \text{ mph} \\ (2) \end{array}$$

5 miles = 8 km.

Sunita says that Peter walked more than 20 km.

- (b) Is Sunita right?
You must show all your working.

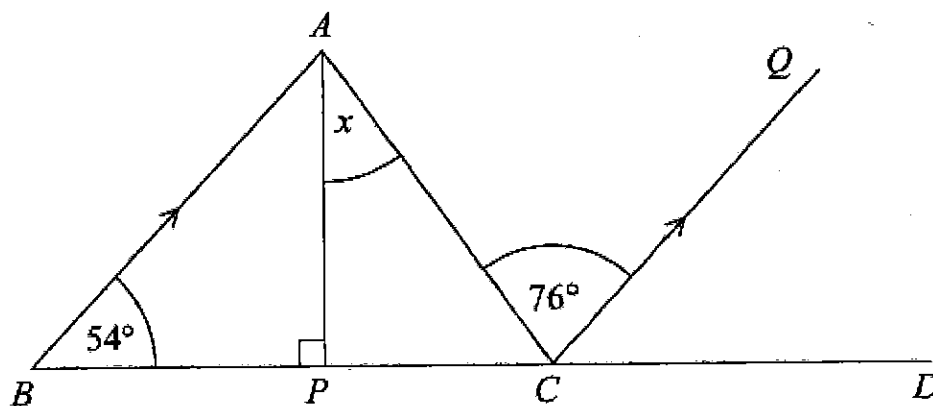
$$15 \text{ miles} = 3 \times 8 \quad |$$
$$= 24 \text{ km} \quad |$$

24 km > 20 km, so Sunita is correct.

(2)

(Total 4 marks)

16.



BPCD is a straight line.
BA is parallel to *CQ*.
AP is perpendicular to *BC*.

Angle $ABC = 54^\circ$

Angle $ACQ = 76^\circ$

Work out the size of the angle marked x .

Give reasons for your answer.

$$\begin{aligned} \angle BAP &= 180 - (90 + 54) \text{ (Angles in a triangle total } 180^\circ) \\ \angle BAP &= 36^\circ \\ \angle BAP (36^\circ) + \angle PAC (x) &= 76^\circ \text{ (Alternate angles are equal.)} \\ 76 - 36 &= 40^\circ (\angle BAP) \end{aligned}$$

(Total 4 marks)

$$y = x^2 - 4x - 2, x = -1$$

$$y = (-1)^2 - 4(-1) - 2$$

$$= 3$$

$$y = x^2 - 4x - 2, x = 2$$

$$= (2)^2 - 4(2) - 2$$

$$= 4 - 8 - 2$$

$$= -6$$

$$y = x^2 - 4x - 2, x = 3$$

$$y = 3^2 - 4(3) - 2$$

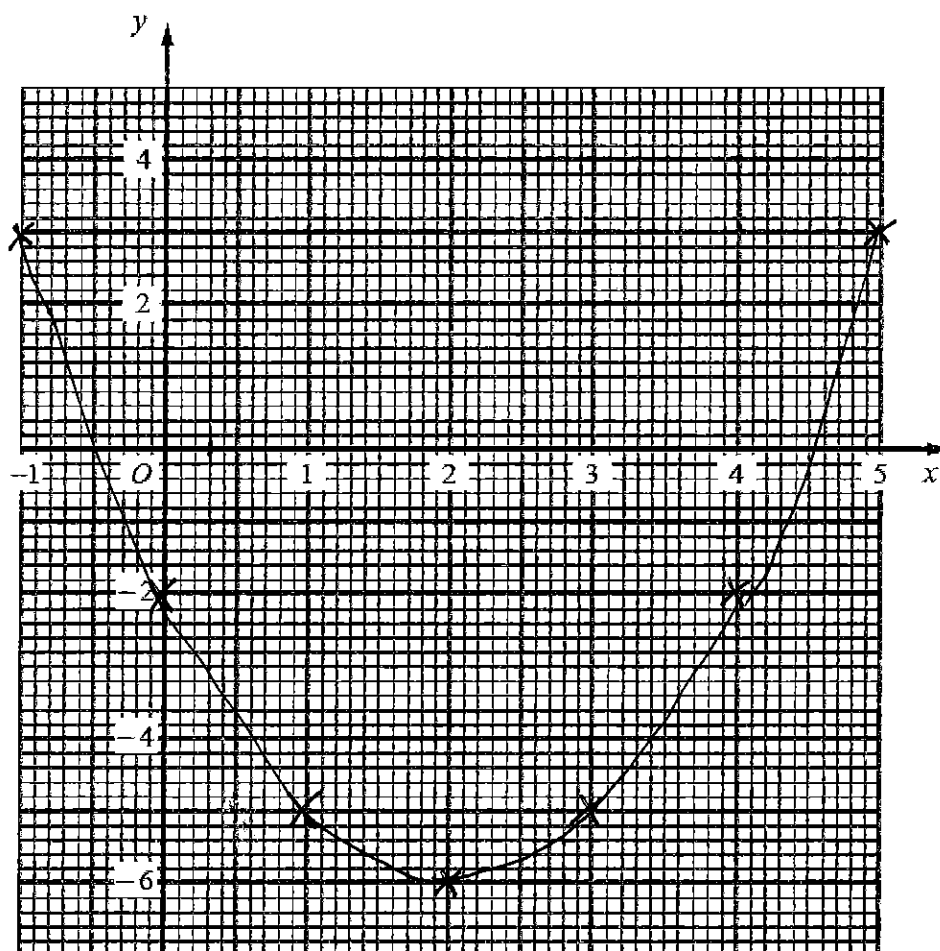
$$= 9 - 12 - 2$$

$$= -5$$

17. (a) Complete the table of values for $y = x^2 - 4x - 2$

x	-1	0	1	2	3	4	5
y	3	-2	-5	-6	-5	-2	3

- (b) On the grid, draw the graph of $y = x^2 - 4x - 2$



(2)

- (c) Use your graph to estimate the values of x when $y = -3$

$$x = 0.3$$

$$x = 3.7$$

(2)

(Total 6 marks)

18. The table shows some information about the average adult spending in 2008 as a percentage of average **total** adult spending in 2008.

Item	Percentage
food	11%
housing	11%
leisure	13%
clothes	5%
transport	14%
household goods	8%
other items	38%

In May 2008, Katie spent a total of £425.

She spent £48.45 of the £425 on food.

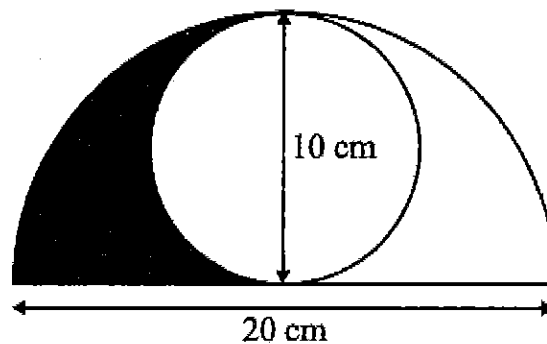
Compare the percentage that Katie spent on food with the average adult spending on food.

$$\frac{48.45}{425} \times 100 = 11.4\%$$

Average food spend is 11%,
Katie's is 11.4%, so she spends more.

(Total 3 marks)

19. The diagram shows a circle inside a semicircle.



The circle has a diameter of 10 cm.

The semicircle has a diameter of 20 cm.

Work out the area shaded.

Give your answer correct to 1 decimal place.

$$\begin{aligned}\text{Semi-circle} &= \frac{1}{2} \pi r^2 \\ &= \frac{1}{2} \times \pi \times 10^2 \\ &= 157.079 \quad (50\pi) \quad | \end{aligned}$$

$$\begin{aligned}\text{Circle} &= \pi r^2 \\ &= \pi \times 5^2 \\ &= 78.539 \quad (25\pi) \quad | \end{aligned}$$

$$\begin{aligned}\text{Shaded} &= \frac{157.079 - 78.539}{2} \quad | \quad \frac{(50\pi - 25\pi)}{2} \quad | \\ &= 39.269 \quad (12.5\pi) \\ &= 39.3 \quad (1 \text{ dp}) \end{aligned}$$

39.3 |
..... cm²

(Total 5 marks)

20. Chris works in a cafe.
At noon one day he records the number of customers sitting at each table in the cafe.
Here are his results.

Number of customers sitting at a table	Number of tables
0	4
1	5
2	10
3	7
4	3
5	1

- (a) Work out the total number of tables in the cafe.

$$4 + 5 + 10 + 7 + 3 + 1 = 30$$

$$\begin{array}{r} 30 \\ \hline \end{array} \quad (1)$$

- (b) Work out the total number of customers sitting at tables in the cafe.

$$\begin{array}{l} 4 \times 0 = 4 \\ 5 \times 1 = 5 \\ 10 \times 2 = 20 \\ 7 \times 3 = 21 \\ 3 \times 4 = 12 \\ 1 \times 5 = 5 \end{array} \quad \begin{array}{l} 4 + 5 + 20 + 21 + 12 + 5 \\ = 63 \end{array}$$

$$\begin{array}{r} 63 \\ \hline \end{array} \quad (2)$$

- (c) Work out the mean number of customers sitting at a table.

$$\begin{array}{l} \text{Mean} = 63 \div 30 \\ = 2.1 \end{array}$$

$$\begin{array}{r} 2.1 \\ \hline \end{array} \quad (2)$$

(Total 5 marks)

21. There are only red beads and green beads in a bag.
The ratio of the number of red beads to the number of green beads is 5 : 9

(a) What fraction of the beads are red?

$$\begin{array}{r} 5 + 9 \\ = 14 \end{array}$$

$$\begin{array}{r} 5 \\ \hline 14 \end{array}$$

(1)

There is a total of 84 beads in the bag.

(b) How many of the beads are green?

$$\begin{array}{r} 84 \div 14 \\ = 6 \\ 9 \times 6 \\ = 54 \end{array}$$

$$\begin{array}{r} 54 \\ \hline \end{array}$$

(3)

Susie is going to put some more beads in the bag.

There will still be only red beads and green beads in the bag.

Susie wants to have twice as many green beads as red beads in the bag.

(c) What beads should she put in the bag?

You must explain your answer.

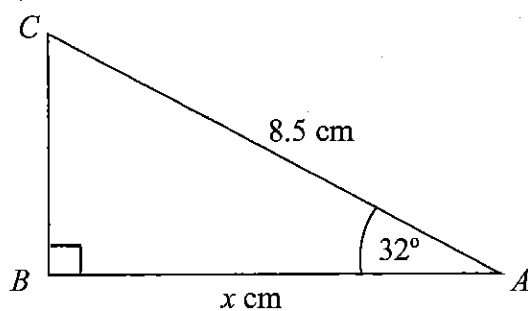
$$\begin{array}{cc} R : G \\ 5 : 9 \\ \downarrow \quad \downarrow \\ 30 : 54 \end{array}$$

$$\begin{array}{l} 30 \times 2 = 60 \\ 60 - 54 = 6 \end{array} \quad \begin{array}{l} \text{She should add} \\ 6 \text{ green beads.} \end{array}$$

(3)

(Total 7 marks)

22. ABC is a right-angled triangle.



Work out the value of x .

Give your answer correct to 1 decimal place.

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

$$\cos 32 = \frac{x}{8.5}$$

$$x = \cos 32 \times 8.5$$

$$x = 7.208$$

$$x = 7.2 \text{ cm}$$

$$7.2 \text{ cm}$$

(Total 2 marks)

TOTAL FOR PAPER IS 80 MARKS

