MS REG

Q16.

edexcel

GCSE Mathematics Practice Tests: Set 3

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.

ALWAYS LEARNING PEARSON

Practice Tests: Set 3 Regular (3F) – Version 1.0

Types of Number

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. Here is a list of numbers.

6 9 10 15 19 27

From the numbers in the list write down

(i) the square number,

1, 4, 9, 16...

9

(ii) the prime number,

Two factors!

19

(iii) the cube number,

1, 8, 27, 64...

27

(Total 3 marks)

Forming and Solving Equations

2. Nathan thinks of a number. x
He doubles the number. $2x$
He adds 5 $2x+5$

His answer is 17

What number does Nathan think of?

$2x+5=17$

(-5) $2x=12$

$(\div 2)$ $x=6$

6

(Total 3 marks)

Single Event Probability

3. Sally makes a fair 8-sided spinner for a game.

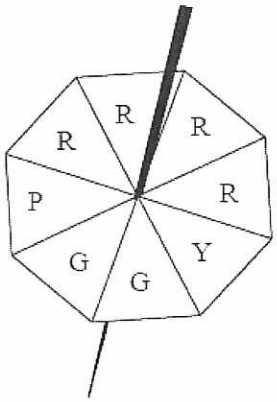


Diagram **NOT** accurately drawn

Sally is going to spin the spinner once.
The spinner will land on one of the letters shown in the diagram.

impossible	unlikely	evens	likely	certain

(*a*) From the list above, write down the word that best describes the likelihood

(i) that the spinner will land on the letter Y

Unlikely

(ii) that the spinner will land on the letter R

"4 out of 8" = $\frac{4}{8} = \frac{1}{2}$

Evens

(iii) that the spinner will land on the letter T

No T.

Impossible

(3)

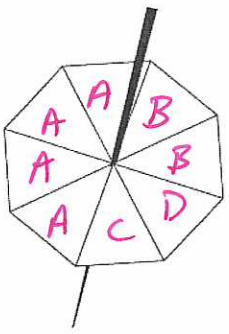
Sally makes a different fair 8-sided spinner.
The letters A, B, C and D will be on the spinner.

Twice as many A than B

The probability that the spinner will land on A is twice the probability that the spinner will land on B.

Same as D

The probability that the spinner will land on C is the same as the probability that the spinner will land on D.



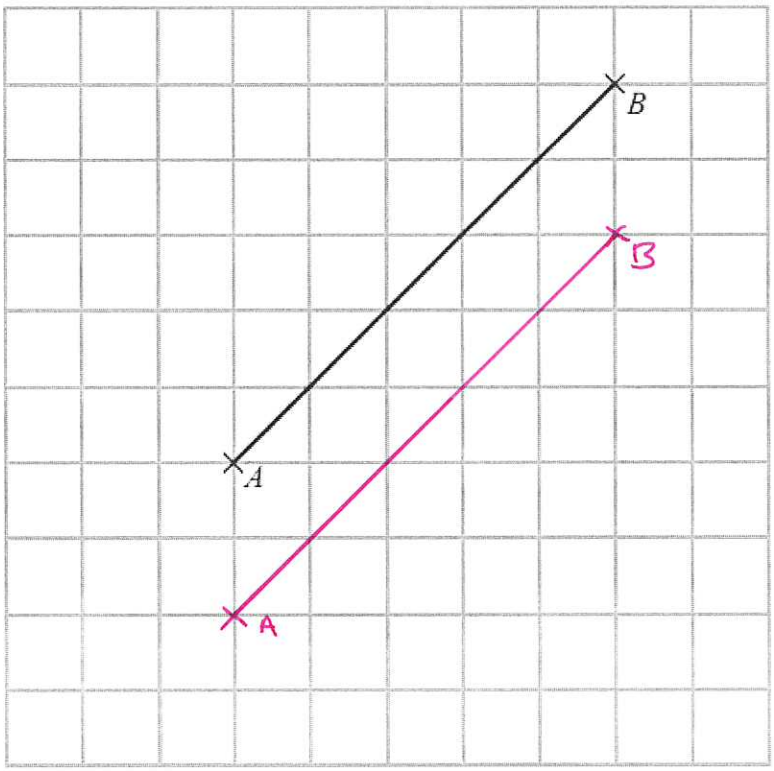
(*b*) Use this information to complete the spinner.

(2)

(Total 5 marks)

Parallel Lines

4.



On the grid, draw a line that is both
parallel to the line AB → Never touch
and the same length as the line AB.

(Total 2 mark)

Percentages of an Amount

5. (*a*) Work out 40% of 20.

	100% = 20
(÷10)	10% = 2
(×4)	40% = 8

8

(2)

Here are four numbers.

Converting FDP

0.43	$\frac{3}{7}$	43.8%	$\frac{7}{16}$
0.43	0.428	0.438	0.4375

USE YOUR CALCULATOR!

(*b*) Write these numbers in order of size.
Start with the smallest number.

(2) 0.43
(1) 0.428
(4) 0.438
(3) 0.4375

$\frac{3}{7}$, 0.43, $\frac{7}{16}$, 43.8%

(2)

(Total 4 mark)

Types of Number

6. Sarah says,

"When square a prime number you always get an odd number."

(*a*) Write down one example to show that Sarah is wrong.

2 is prime. $2^2 = 2 \times 2 = 4$ 4 is NOT odd it is even.

(1)

Emily says,

"The lowest number that 3 and 6 both divide into exactly is 18"

(*b*) Is Emily correct?
You must give a reason for your answer.

No it is 6 $6 \div 3 = 2$ and $6 \div 6 = 1$

(1)

(Total 2 mark)

Forming Expressions

7 Batteries are sold in packets and in boxes.

There are 4 batteries in a packet.
There are 20 batteries in a box.

Derek buys one box of batteries.
He takes t batteries out of the box.

(a) Write down an expression, in terms of t, for the number of batteries left in the box.

one box = 20

take t

20 − t

(1)

Sameena buys x packets of batteries and y boxes of batteries.

(b) Write down an expression, in terms of x and y, for the total number of batteries Sameena buys.

one pack = 4

one box = 20

4x + 20y

(2)

(Total 3 marks)

Two Way Tables

8 People can buy three types of plane tickets.

They can buy

an Economy ticket
a Premium ticket
or a Business ticket

(1) 200 people buy plane tickets.

(2) 92 males buy tickets
(3) 30 of the males buy Business tickets
(4) 62 females buy Economy tickets

(4) A total of 44 people buy Business tickets.
(5) A total of 60 people buy Premium tickets.

How many males buy Premium tickets?
You must show all your working.

	ECONOMY	PREMIUM	BUSINESS	TOTAL
MALE		(9) = 28	(3) = 30	(2) = 92
FEMALE	(4) = 62	(8) = 32	(7) = 14	(6) = 108
TOTAL		(5) = 60	(4) = 44	(1) = 200

Fill the gaps: (6) $200 - 92 = 108$

(7) $44 - 30 = 14$

(8) $108 - 62 - 14 = 32$

(9) $60 - 32 = 28$ = male premium

(Total 4 marks)

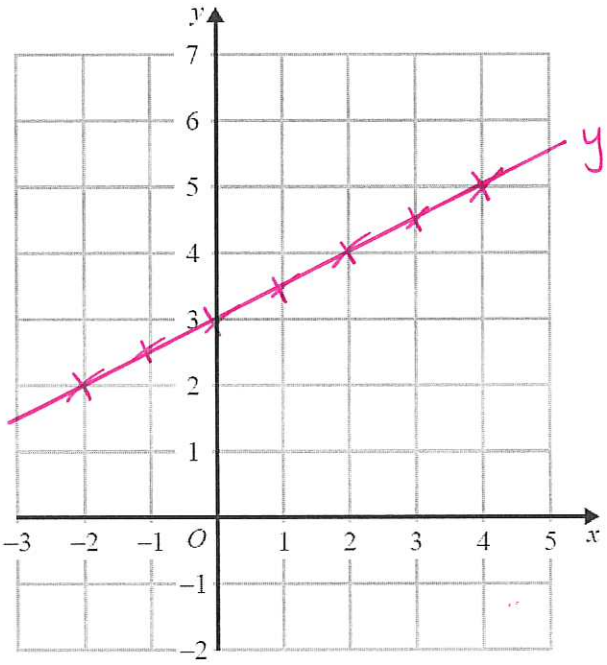
Plotting Straight Lines

9 On the grid, draw the graph of $y = \frac{1}{2}x + 3$ for values of x from –2 to 4.

$x=4$: $y = \frac{1}{2}(4)+3 = 5$
$x=3$: $y = \frac{1}{2}(3)+3 = 4.5$
$x=2$: $y = \frac{1}{2}(2)+3 = 4$

x	-2	-1	0	1	2	3	4
y	2	2.5	3	3.5	4	4.5	5

Use pattern



$y = \frac{1}{2}x+3$

(Total 3 marks)

Ratio Recipes

10 Here are the ingredients needed to make 10 pancakes.

Pancakes
Ingredients to make **10** pancakes
300 m*l* of milk 120 g of flour 2 eggs

Matthew makes 30 pancakes.

(*a*) Work out how much flour he uses.

Scale factor | 30 ÷ 10 = 3 ∴ Ingredients must be (x3).

Flour | 120g x 3 = 360g

360 ..... g

(2)

Tara makes some pancakes.
She uses 750 m*l* of milk.

(*b*) Work out how many pancakes she makes.

Scale factor | 750ml ÷ 300ml = 2.5 ∴ 2.5 batches

Pancakes | 10 x 2.5 = 25

25 .....

(2)

(Total 4 mark)

11. £360 is shared in the ratio 1 : 3 : 5

Work out the difference between the largest share and the smallest share.

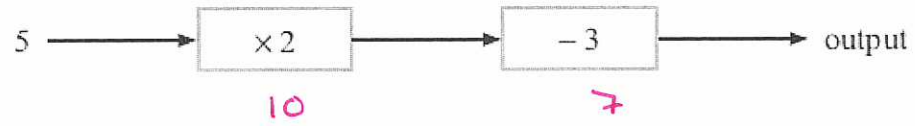
Total parts	1+3+5 = 9 parts
	£360 = 9 parts
(÷9)	£40 = 1 part
1 : 3 : 5 (×40)	40 : 120 : 200
Difference (Big - Small)	£200 − £40 = £160

£ 160

(Total 3 marks)

Function Machines

12. (*a*) Work out the output for this number machine.

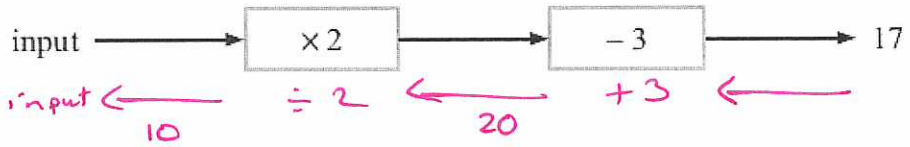


7

.....

(2)

(*b*) Work out the input for this number machine.

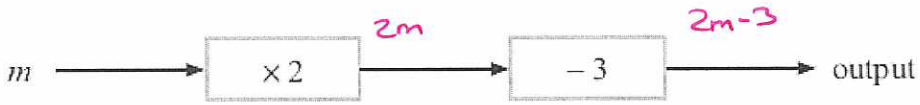


10

.....

(2)

(*c*) The input for this number machine is m.



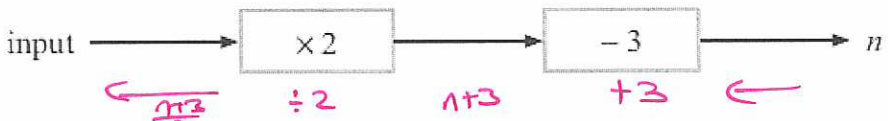
Find an expression, in terms of m, for the output.

$2m-3$

.....

(2)

(*d*) The output for this number machine is n.



Find an expression, in terms of n, for the output.

Typo

$\frac{n+3}{2}$

.....

(2)

(Total 8 marks)

Adding Units of Time

13. Jenny wants to record 15 minutes of songs for a film.
The table shows the playing time of 3 songs she has recorded.

Song	Playing time
A	4 minutes and 33 seconds
B	3 minutes and 42 seconds
C	3 minutes and 06 seconds

How much more time, in minutes and seconds, does she need to record?

(Minutes) A+B+C : 4mins + 3mins + 3mins = 10mins

(Seconds) A+B+C : 33secs + 42secs + 6secs = 81secs

81 seconds in mins : 81 seconds = 1min 21secs

Total A+B+C : 11mins 21 secs

Amount Needed for 15mins : 15mins - 11mins 21secs

= 3mins 39 secs

3 ..... minutes 39 ..... seconds

(Total 4 marks)

14. The table gives some information about the costs of posting large letters.

First Class Post – Delivery takes 1 to 2 days	
Weight (g)	**Cost**
50 – 100	50p
101 – 250	72p
251 – 500	£1.04
501 – 750	£1.51

Second Class Post – Delivery takes 3 to 5 days	
Weight (g)	**Cost**
50 – 100	40p
101 – 250	59p
251 – 500	85p
501 – 750	£1.23

Leroy works for a company.
In January he sends some large letters by first class post.

The table gives information about numbers and weights of the large letters.

Weight (g)	Number of large letters
50 – 100	28
101 – 250	32
251 – 500	50
501 – 750	18

money problem

(*a*) Calculate the total cost of sending these large letters by first class post.

50–100 | 50p × 28 = £14.00
101–250 | 72p × 32 = £23.04
251–500 | £1.04 × 50 = £52.00
501–750 | £1.51 × 18 = £27.18
Total = £116.22

£ 116.22

(3)

In February, Leroy is going to send some more large letters.

The table gives information about the weights and numbers of these large letters.

Weight (g)	Number of large letters
50 – 100	32
101 – 250	40
251 – 500	68
501 – 750	34

Leroy can use either first class post or second class post.
He thinks it will cost £20 less to send the letters by second class post.

(*b*) Is Leroy correct?
You must show your working.

1st class

50-100 | 32 × 50p = £16.00
101-250 | 40 × 72p = £28.80
251-500 | 68 × £1.04 = £70.72
501-750 | 34 × £1.51 = £51.34
Total = £166.86

2nd class

50-100 | 32 × 40p = £12.80
101-250 | 40 × 59p = £23.60
251-500 | 68 × 85p = £57.80
501-750 | 34 × £1.23 = £41.82
Total = £136.02

(4)

(Total 7 marks)

Conclusion: No it will actually cost £30.84 less.

Inequalities

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1. $-2 < n \leq 3$
n is an integer. → whole numbers

(*a*) Write down all the possible values of n.

$-1, 0, 1, 2, 3$

(2)

x is a number.
Another number is 9 greater than x.
Both numbers are whole numbers.

The total of the two numbers is less than 60

(*b*) Find the greatest possible value of x.

x	$x + x + 9 < 60$
$x + 9$	$2x + 9 < 60$
collect	$2x < 51$
$(\div 2)$	$x < 25.5$
conclusion	$x = 25$ (maximum)

25

(3)

(Total 5 marks)

Linear Sequences

16. The nth term of sequence A is $3n - 2$
The nth term of sequence B is $10 - 2n$

Sally says there is only one number that is in both sequence A and sequence B.

Is Sally right?
You must explain your answer.

A:

Term	1	2	3	4	5	6
Sequence	1	(4)	7	10	13	16

B:

Term	1	2	3	4	5	6
Sequence	8	6	(4)	2	0	-2

Conclusion: Sally is correct since only 4 is in both sequences, and A is increasing but B is decreasing.

(Total 2 marks)

SOHCAHTOA

6.

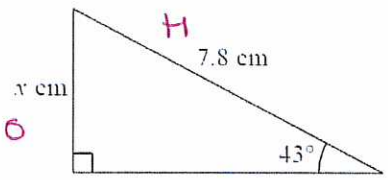


Diagram **NOT** accurately drawn

Work out the value of x.
Give your answer correct to 3 significant figures.

~~SOHCAHTOA~~

$\sin\theta = \frac{O}{H}$

$\sin 43 = \frac{x}{7.8}$

$(\times 7.8)$ $\quad 7.8 \times \sin 43 = x = 5.32\,(3\text{ s.f.})$ cm

$x =$ 5.32cm

(Total 3 marks)

Formulae (substitution and Rearranging)

8. Here is a formula used to work out the speed, v mph, of a car making an emergency stop.

$$v = \sqrt{21d}$$

d feet is the length of the mark the car's tyres make on the road when making an emergency stop.

A car makes an emergency stop.
The car's tyres make a mark 90 feet long.

(a) Work out the speed of the car.
Give your answer correct to the nearest whole number.

$V = \sqrt{21(90)}$

$V = 44$ (nearest whole) mph

44 ..... mph

(2)

A car made an emergency stop.
The car's speed was 50 mph.

(b) Work out the length of the mark on the road.
Give your answer correct to the nearest whole number.

$V = \sqrt{21d}$	$50 = \sqrt{21d}$
$(\text{ANS})^2$	$2500 = 21d$
$(\div 21)$	$119 = d$ (nearest whole)

119 ..... feet

(3)

(Total 5 marks)

Fractions and Percentages of an Amount

19. Andy has some counters.

15% of the counters are red.

$\frac{2}{5}$ of the counters are blue.

The rest of the counters are yellow.

There are 27 yellow counters.

How many blue counters are there?

Total = 100%

Blue = $\frac{2}{5}$ = 40%

Yellow = 45%

(÷9)

(×20)

Blue = 40%

100% − 15% = 85%

85% − 40% = 45%

27 counters = 45%

3 counters = 5%

60 counters = 100%

∴ Blue = $\frac{2}{5}$ of 60 = $\frac{2}{5}$ × 60 = 24

24

(Total 5 marks)

Area of Rectangles
DIY Maths.

20. Here is a diagram of Gareth's lawn.

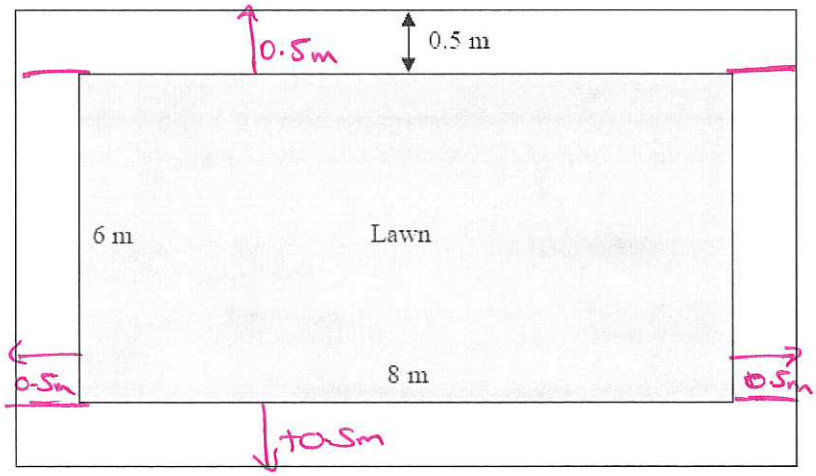


Diagram **NOT** accurately drawn

The lawn is in the shape of a rectangle. The length of the lawn is 8 m.
The width of the lawn is 6 m.

There is a path all the way around the lawn. The path is made from paving slabs.
Each paving slab is a square 0.5 m by 0.5 m. The width of the path is 0.5 m.

Work out the number of paving slabs in the path.

lengthways ⟷ | Length (total) = 8m + 0.5m + 0.5m = 9m

Number of slabs | 9m ÷ 0.5m = 18 lengthways at top and bottom

widthways ↕ | width = 6m

Number of slabs | 6m ÷ 0.5m = 12 widthways

Total slabs | 18 + 18 + 12 + 12 = 60

60

(Total 3 marks)

Bearings and Scale Diagrams

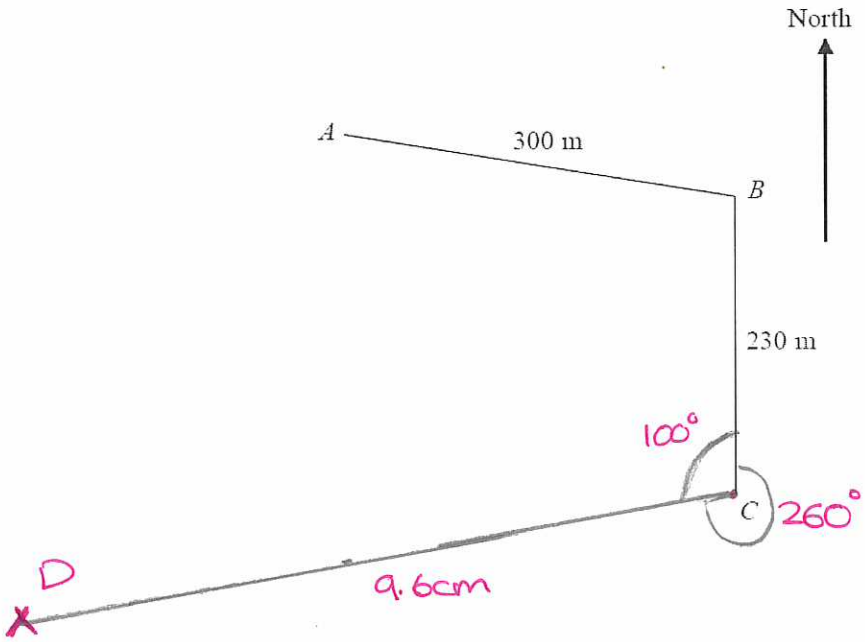
21. The diagram shows an accurate scale drawing of part of the boundary of a field.
The complete boundary of the field is in the shape of a quadrilateral *ABCD*.

AB = 300 metres.
BC = 230 metres.
Point *B* is due north of point *C*.

The scale of the diagram is 1 cm to 50 metres.

The bearing of *D* from *C* is 260°. → measure 100° the wrong way to draw this!
AD = 480 metres.

Complete the scale drawing of the boundary of the field.
Mark the position of *D*.



AD = 480m

1cm : 50 metres

9.6 cm : 480 metres

480 ÷ 50 = 9.6

(Total 2 marks)

TOTAL FOR PAPER IS 80 MARKS