Mathematics

November 2017 Paper 2 (Calculator Allowed)
Part 2 (Second half of the paper)
Edexcel Foundation Tier

Time: 45 minutes

Q	Topic	Max Mark	My Marks
14	Substitution, Using Algebra	4	
15	Percentage Increase, Calculation Problems	5	
16	Solving Equations	3	
17	Percentage Change (Profit)	3	
18	Circumference of a Circle	3	
19	Writing Ratio, Writing Probability	3	
20	Transformations, Rotation, Translation	2	
21	Indices	4	
22	Pythagoras, Trigonometry (SOHCAHTOA)	5	
23	Using a Calculator	3	
24	Expanding, Factorising and Solving Quadratics	5	
	Total	40	

14 a and b are odd numbers.

   (a) Give an example to show that the value of $2(a + b)$ is a multiple of 4

<div align="right">(2)</div>

   (b) Show that, when a and b are both odd numbers, the value of $2(a + b)$ will always be a multiple of 4

<div align="right">(2)</div>

<div align="right">**(Total for Question 14 is 4 marks)**</div>

15 Mr Page uses oil to heat his home.

At the beginning of November there were 1000 litres of oil in his oil tank.

Mr Page bought enough oil to fill the tank completely.
He paid 50p per litre for this oil.
He paid a total amount of £750

At the end of February Mr Page had 600 litres of oil in the tank.
He bought enough oil to fill the tank completely.
The cost of oil had increased by 4%.

Work out the total amount Mr Page paid for the oil he bought in February.

£...

16 Solve $5x - 6 = 3(x - 1)$

$x =$ ....

(Total for Question 16 is 3 marks)

17 Emily buys a pack of 12 bottles of water.
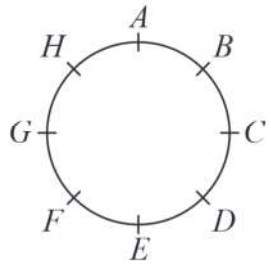The pack costs £5.64

Emily sells all 12 bottles for 50p each.

Work out Emily's percentage profit.
Give your answer correct to 1 decimal place.

.... %

(Total for Question 17 is 3 marks)

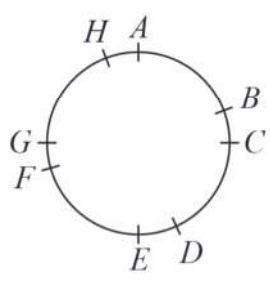**18** Hasmeet walks once round a circle with diameter 80 metres.

There are 8 points equally spaced on the circumference of the circle.

(a) Find the distance Hasmeet walks between one point and the next point.

....m

(2)

Four of the points are moved, as shown in the diagram below.

Hasmeet walks once round the circle again.

(b) Has the mean distance that Hasmeet walks between one point and the next point changed?
You must give a reason for your answer.

....

....

(1)

(Total for Question 18 is 3 marks)

19 There are only blue cubes, yellow cubes and green cubes in a bag.
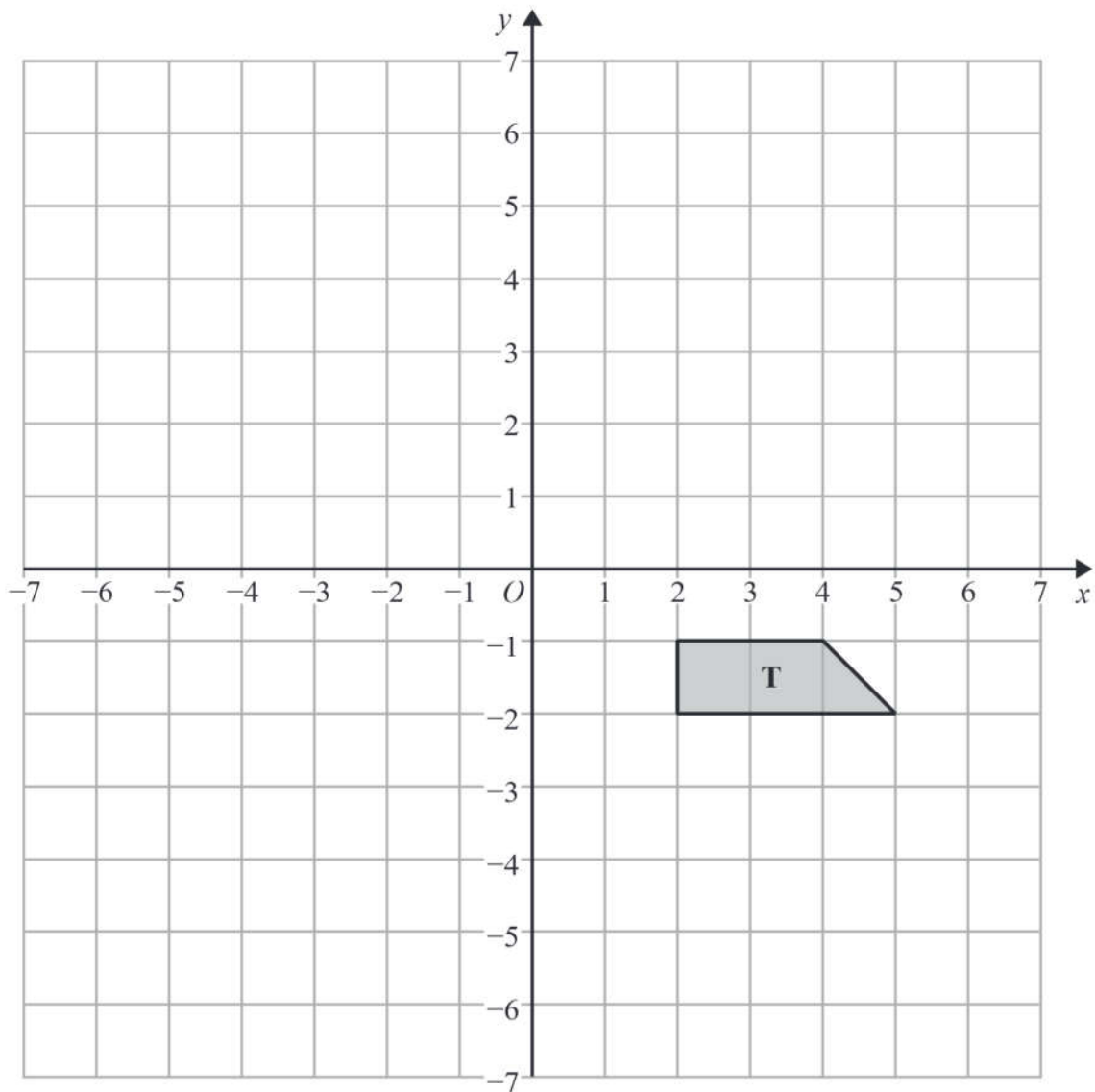
There are

twice as many blue cubes as yellow cubes

and four times as many green cubes as blue cubes.

Hannah takes at random a cube from the bag.

Work out the probability that Hannah takes a yellow cube.

....

(Total for Question 19 is 3 marks)

20

(a) Rotate trapezium **T** 180° about the origin.
Label the new trapezium **A**.

(1)

(b) Translate trapezium **T** by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$
Label the new trapezium **B**.

(1)

(Total for Question 20 is 2 marks)

21 $p^3 \times p^x = p^9$

(a) Find the value of x.

$x =$ ....

$(7^2)^y = 7^{10}$

(b) Find the value of y.

$y =$ ....

$100^a \times 1000^b$ can be written in the form 10^w

(c) Show that $w = 2a + 3b$

(2)

(Total for Question 21 is 4 marks)

22 *ABCD* is a trapezium.
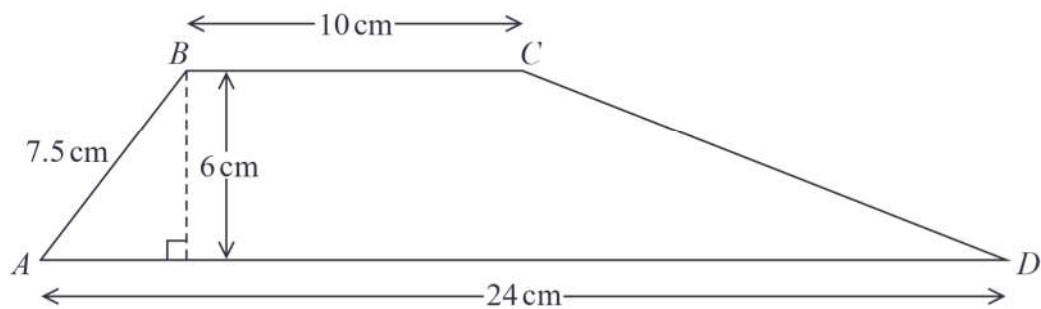

Work out the size of angle *CDA*.
Give your answer correct to 1 decimal place.

.... °

(Total for Question 22 is 5 marks)

23 Use your calculator to work out $\sqrt{\dfrac{\sin 25° + \sin 40°}{\cos 25° - \cos 40°}}$

(a) Write down all the figures on your calculator display.

....

(2)

(b) Write your answer to part (a) correct to 2 decimal places.

....

(1)

(Total for Question 23 is 3 marks)

24 (a) Solve $2x^2 = 72$

....

(2)

(b) Expand and simplify $(2x + 1)(3x - 2)$

....

(2)

(c) Factorise $x^2 + 6x + 9$

....

(1)

(Total for Question 24 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS