

## Instructions

- Your team will have 45 minutes to answer 10 questions. Each team will have the same questions.
- Each question is worth a total of 6 marks. However, some questions are easier than others!
- Do not spend too long on any one question without sharing it with the rest of the team.
- You will have to decide your team's strategy for this group competition.
- There is only one response sheet per team.
- Remember to finalise your answers and write them on the response sheet before the end of the round.

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## QUESTION 1

The basic State Pension used to be £98.70 per week.

This amount was increased by  $2\frac{1}{2}\%$  and rounded up to the nearest penny.

What is the new basic State Pension in pounds, per week?

[6 marks]

## QUESTION 2

Naomi had one £2 coin, two £1 coins, three 50p coins, four 20p coins, five 10p coins, six 5p coins, seven 2p coins and eight 1p coins in her purse.

- (a) Firstly Naomi bought some food, costing £5.39.

As she was in a rush to pick up her children from school, she paid the exact amount with the least number of coins possible.

How many coins did she have left in her purse? [3 marks]

- (b) Next, Naomi went straight to school, arriving ten minutes before she needed to pick up her children.

Whilst waiting, she bought them some sweets, costing 99p.

Having a bit of time, she decided to pay this exact amount with as many coins from her purse as possible.

How many coins did she have left in her purse?

[3 marks]

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## QUESTION 3

- (a)  $14 \times (d + e + f) = 'def'$  where  $d$ ,  $e$  and  $f$  represent different digits and  $'def'$  is a three-digit number.

What is the value of  $'def'$ ? [3 marks]

- (b)  $19 \times (a + b + b) = 'abb'$  where  $a$  and  $b$  represent different digits and  $'abb'$  is a three-digit number.

What is the maximum possible value of  $'abb'$ ?

[3 marks]

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## QUESTION 4

- (a) Jo took 10% *more* time to run the second half of a marathon than she took to run the first half.

It took her 1 hour 28 minutes to run the second half of the marathon.

How long did Jo take to run the marathon, in hours and minutes? [3 marks]

- (b) Usain Bolt ran the 200m in 19.19 seconds.

It took him 10% *less* time to run the second 100m than it took him to run the first 100m.

How long in seconds did it take him to run the first 100m? [3 marks]

## QUESTION 5

In the Olympics, the order that a country is placed in the medal table is based firstly on the number of Gold medals they win, then the number of Silver medals and finally the number of Bronze medals.

A possible outcome is:

	Position	Gold	Silver	Bronze
Kenya	15th	2	1	0
Jamaica	16th	1	9	3
Croatia	17th	1	8	22

With three medals available the positions of Great Britain and China were as follows:

	Position	Gold	Silver	Bronze
China	2nd	27	32	48
Great Britain	3rd	26	31	47

China won no medals of the last three available.

In how many different ways could Great Britain finish above China in the medal table?

[6 marks]

## QUESTION 6

A digit is to be placed in each of the nine blank cells in the  $3 \times 3$  grid shown below.

Every pair of neighbouring digits vertically down or horizontally to the right forms a two-digit number.

If all of the two-digit numbers are squares, what is the sum of the numbers that must be placed in the four corners?


[6 marks]

## QUESTION 7

The reverse number of the year 2019 is 9102.

The sum of these two numbers is 11121.

- (a) After 2019, what is the first year that when added to its reverse number equals 11121? [3 marks]
- (b) After 2019, what is the second year that when added to its reverse number equals 11121? [3 marks]



## QUESTION 8

The sum of the page numbers, in a book, is less than 2019.

The pages are numbered in order, from 1 to  $n$ .

What is the largest possible value of  $n$ ?

[6 marks]

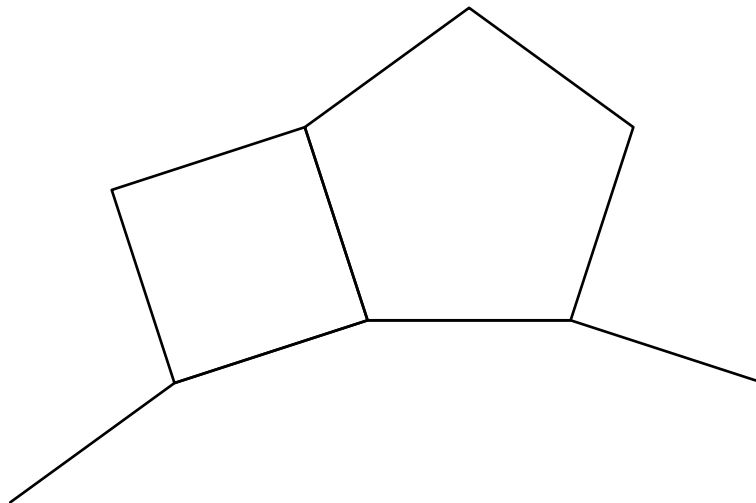
## QUESTION 9

A regular pentagon and a square share a common side, as shown.

Another regular polygon shares a common side with the pentagon and a common side with the square. Part of this regular polygon is shown.

How many sides does this regular polygon have?

NOTE: The external angle of a regular polygon with  $n$  sides is  $\frac{360}{n}^\circ$ .



[6 marks]

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## QUESTION 10

The letters  $A$ ,  $B$ ,  $C$ ,  $D$ ,  $E$ ,  $F$ ,  $G$  and  $H$  each represent different primes.

(a)  $A + B = 14$


$$C - D = 17$$

What is the value of  $D \times C - B \times A$ ? [3 marks]



(b)  $E + F + G = H$

What is the smallest possible value of  $H$ ? [3 marks]

TEAM NUMBER 

SCHOOL NAME 

**1. New State Pension in pounds**

**6. Number**


 



**2. Coins, Coins**

(a)  



(b)  



**7. Year, Year**

(a)  



(b)  

**3. Number, Number**



(a)  



(b)  

**8. Maximum number of pages**

**4. (a) Time in hours and minutes (b) Time in seconds**



(a)  

(b)  



**9. Number of sides**



 

**5. Number of ways**

**10. Value, Smallest value**

(a)  

(b)  

Circle the mark awarded for each question and cross out the others.

FINAL SCORE /60 