

GROUP COMPETITION INSTRUCTIONS

- Your team will have 45 minutes to answer 10 questions. Each team will have the same questions.
- Each question is worth 6 points. However, some questions are easier than others!
- You will have to decide your team's strategy for this group competition.
- There is only one answer sheet per team. Five minutes before the end of the time you will be told to finalise your answers and write them on to the answer sheet. This answer sheet is the only thing that will be marked.



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Question 1

The lock of Claire's locker has a three-digit code such as 5, 2, 4. She has forgotten the code but she knows that all three digits are different. She also knows that if she divides the first digit by the second digit and then squares the result she gets the third digit. Find all possible three-digit codes for her lock.



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Question 2

All the letters in this question represent different positive integers.

If $F=5$, $O=3$ and $X=4$ then $FOX=60$

$BIBLE=66$ and $BALL=28$

Find the value of $LIBEL$.



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Question 3

Find two integers, neither of which has a zero digit, whose product is 1 000 000.



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Question 4

Richard had to arrive at the airport at exactly 10 am. If he is able to drive at an average speed of 60 miles per hour he would arrive early at 9 am. If he drives at an average speed of 40 miles per hour he would arrive late at 11am. How fast should he travel to arrive at the airport at 10 am exactly?

You need to assume that Richard sets out at the same time in each scenario. You are not told what this time is and are not asked for it, but could work it out from the information given. You are asked to work out what his average speed should be if, after setting out at the same time as in the first two examples, he is to arrive exactly on time.



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Question 5

a , b and c are all positive.

$$a \times b = 2$$

$$b \times c = 24$$

$$c \times a = 3$$

What is the value of $a + b + c$?



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Question 6

Shakira chooses, at random, two different single digit numbers, not including zero. She then works out their sum. What is the probability that the sum is a single digit number?

Please give your answer as a fraction in its lowest terms.



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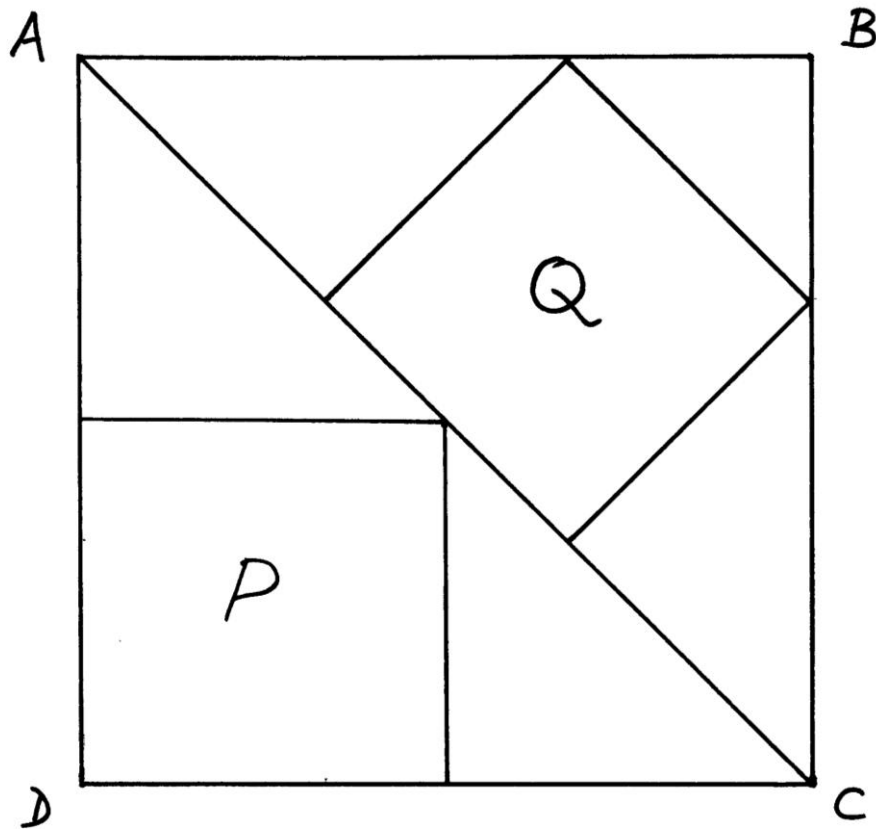


Question 7

$ABCD$ is a square. P and Q are squares drawn in the triangles ADC , ABC as shown.

What is the ratio of the area of square P to the area of square Q ?

Give your answer in the form $a:b$ where a and b are integers with no common factor greater than 1.



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Question 8

One pump used on its own fills a swimming pool in 2 hours. A second pump used on its own fills the same pool in 3 hours. A third pump can be used to empty all the water from the same pool in 90 minutes.

How long would it take to fill the pool if all three pumps were in use at the same time?



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Question 9

The number of diagonals of a regular polygon equals twice the number of sides. How many sides does the polygon have?



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Question 10

The mean of five integers is 4, the median is 3 and the only mode is 1.

List all possible sets of integers as working below.

Give as the final answer, on your answer sheet, the largest product which can be found using just two of the integers in any one of your sets.



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GROUP answer sheet

Team number

School name

1. Three-digit codes	2. Value of LIBEL
3. Two integers whose product is 1 000 000 _____ and _____	4. Speed <div style="text-align: right;">miles per hour</div>
5. Value of $a + b + c$	6. Probability as a fraction in its lowest terms
7. Ratio <div style="text-align: center;">:</div>	8. Time taken to fill pool <div style="text-align: right;">hours</div>
9. Number of sides	10. Largest product

TOTAL SCORE = _____



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