

## Round 1

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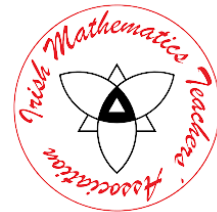
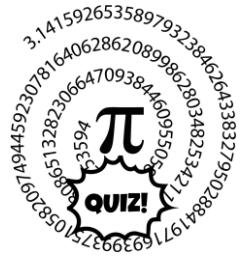
### Question 1

An estate agent's fee for selling a house is €13500. This fee is 3% of the selling price of the house. Calculate the selling price.

### Question 2

There are 10 girls in a mixed class. If two pupils from the class are selected at random, then the probability that both are girls is 0.15.

How many boys are in the class?

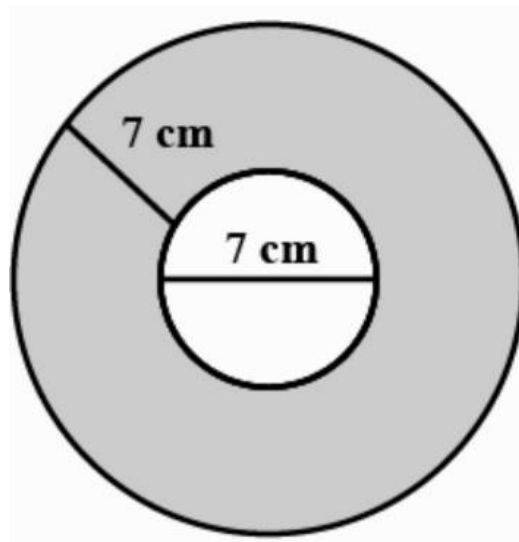


## Round 2

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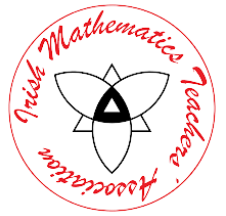
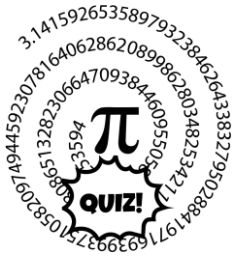
### Question 1

Calculate the area of the grey region in terms of  $\pi$ . The diagram is not to scale.



### Question 2

In a competition, a school is awarded medals in different categories. 36 medals are awarded in Science, 12 are awarded in technology and 18 are awarded in Maths. If these medals had a combined total of 45 persons receiving medals, with only four students awarded medals in all of the three categories, how many students received medals in exactly two of the three categories?

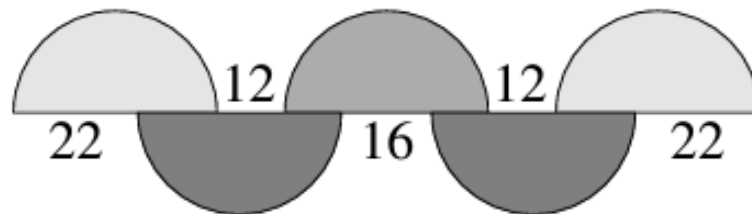


## Round 3

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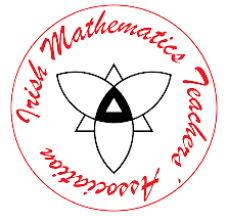
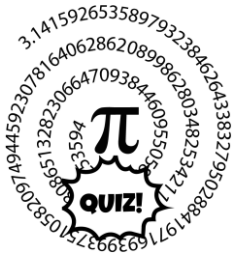
### Question 1

The diagram shows five equal semicircles and the lengths of some line segments in centimetres. What is the radius of the semicircles?



### Question 2

AB is a straight line. The coordinates of A are  $(-9, -4)$ . The midpoint of AB is  $(8, 1.5)$ . Find the coordinates of B.



## Round 4

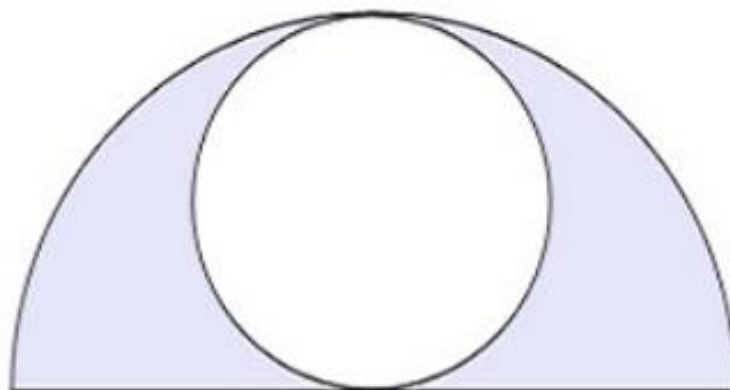
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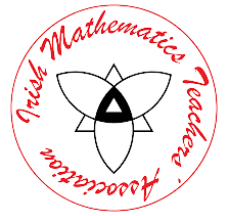
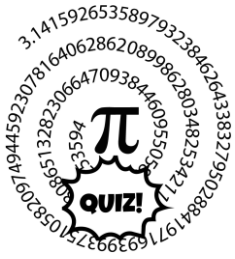
### Question 1

The current value of a smart watch is 20% less than when the smart watch was purchased. By what percentage must the current value of the smart watch increase in order to have its original value?

### Question 2

The diagram shows a circle inside a semi-circle. The circle has a diameter of 24km. The semi-circle has a diameter of 48km. Calculate the area of the shaded region to 1 decimal place.



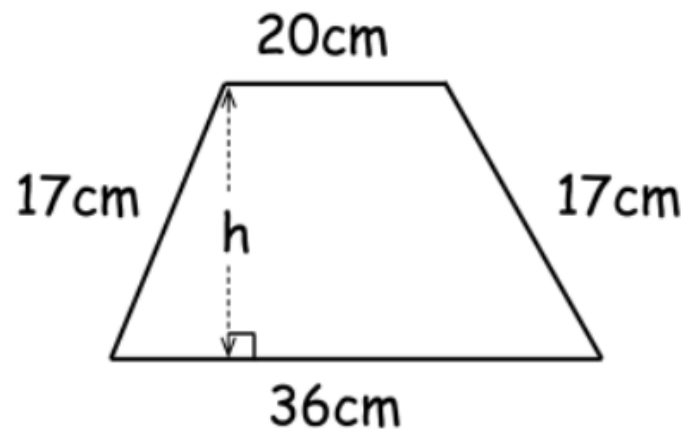


## Round 5

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### Question 1

Find  $h$  in cm the height of the trapezium below.

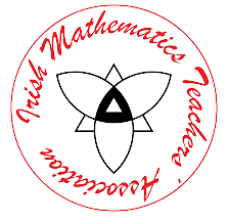
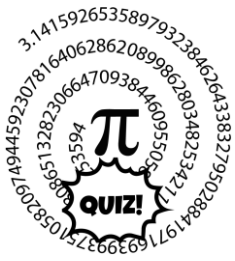


### Question 2

The first five terms of a sequence are shown below.

$$-17, -30, -49, -74, -105, \dots$$

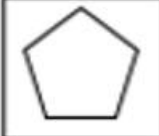
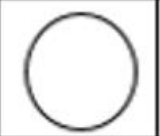
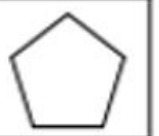
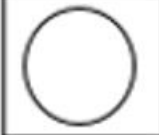
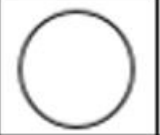

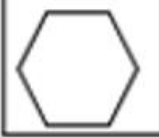
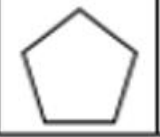

Work out an expression for the  $n$ th term of this sequence in the form of  $an^2 + bn + c$ .



## Round 6

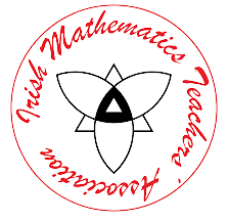
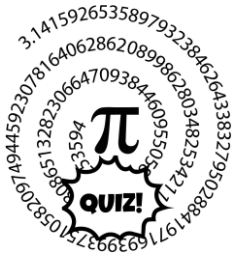
### Question 1

What is the missing total?

			= $\frac{5}{8}$
			= $\frac{3}{8}$
			= 1
= ?	= $\frac{1}{2}$	= $\frac{5}{8}$	

### Question 2

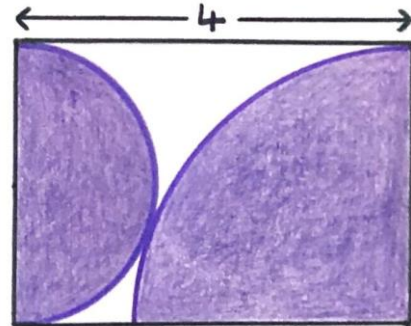
Find the probability of getting exactly two heads when five coins are tossed. ***Give your answer as a rational number.***



## Round 7

### Question 1

What is the shaded area? Give your answer in terms of  $\pi$ .

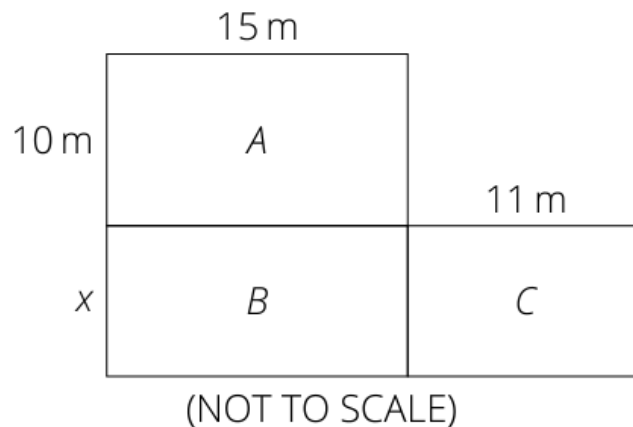


### Question 2

Find the possible values of  $m$ , such that these coordinates  $(m, 3)$  and  $(1, m)$  are 10 units apart.

### Question 3

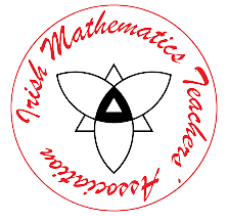
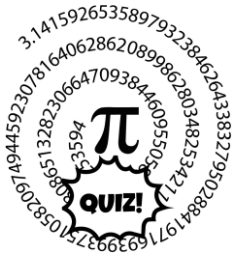
The total perimeter of the three rectangles below is 90m. Calculate the value of  $x$  in meters.



### Question 4

Let  $g(x) = \frac{1}{x^2} - \frac{1}{2x}$  and  $h(x) = 1 - \frac{2}{x}$ , where  $x \neq 0$  and  $x \in R$

Find the values of  $x$  for which  $g(x) = h(x)$ .



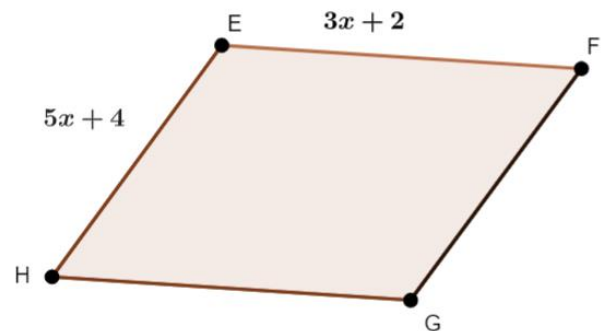
## Round 8

### Question 1

A right triangle has one side that is 7 cm longer than the other side. The hypotenuse is 13 cm long. Find the lengths of the other sides of the triangle.

### Question 2

A parallelogram has side lengths  $3x + 2$  and  $5x + 4$ . The perimeter of the parallelogram is  $44\text{cm}$  and the area is  $64\text{cm}^2$ . Find  $|\angle EHG|$ , to the nearest degree.



### Question 3

Solve the simultaneous equations.

$$\begin{aligned}2x - y &= 5 \\ x + 3y &= \frac{x - 4}{2}\end{aligned}$$

### Question 4

Twelve balloons are arranged in a circle. Counting clockwise, every third balloon is popped. C is the first balloon to be popped. This continues until two balloons remain not popped. Which balloons are the remaining two balloons not popped?

