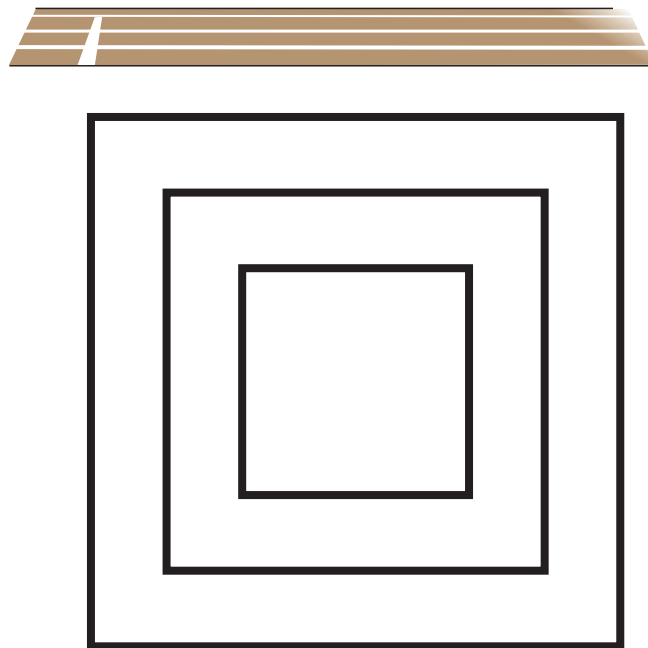




Fair and Square

Three athletes Harper, Willow and Aria ran a race on a special square track. Here is an accurate plan of the track: the scale is 1 cm represents 1 metre.



Harper ran around the outside square, Willow ran around the middle square and Aria ran around the smallest square.

Harper ran 15 laps of her square.

If Willow and Aria ran as far as Harper, how many laps should each of them run?

Who Won the Medals?

Below are given some facts about the number of medals won by the top seven medal-winning countries at a Commonwealth Games.

Can you complete the table below, using these facts?

Canada won 45 gold medals. They won 2 more bronze than silver medals. England won 32 bronze medals and one more silver medal than gold medals.

Australia won 3 fewer gold than England, 33 silver medals and 27 bronze medals.


$\frac{1}{4}$ of New Zealand's medals were gold and 9 were bronze.

Kenya won one more gold than silver and one more silver than bronze.

One third of India's medals were gold and India won 2 more bronze than silver.

Scotland won as many silver as New Zealand and as many bronze as Kenya. They won twice as many silver as gold.

Determine the total number of medals won by the 7 countries.

Country	Gold 	Silver 	Bronze 	Total Medals
Canada				109
England				87
Australia				
New Zealand				20
Kenya				18
India				15
Scotland				

Muddled Medals

The three famous athletes "The Fish", "Lightning" and "Stamina" have muddled up their medals.

Each won the same number of medals.

The Fish and Lightning each won 2 gold medals.

Stamina won the same number of gold and silver medals and twice as many bronze medals as Lightning.

Can you complete the medals table for them?



<i>Athlete</i>	<i>Gold</i>	<i>Silver</i>	<i>Bronze</i>
<i>The Fish</i>			
<i>Lightning</i>			
<i>Stamina</i>			

Points for Winners

Harper and Willow ran 6 races against each other.

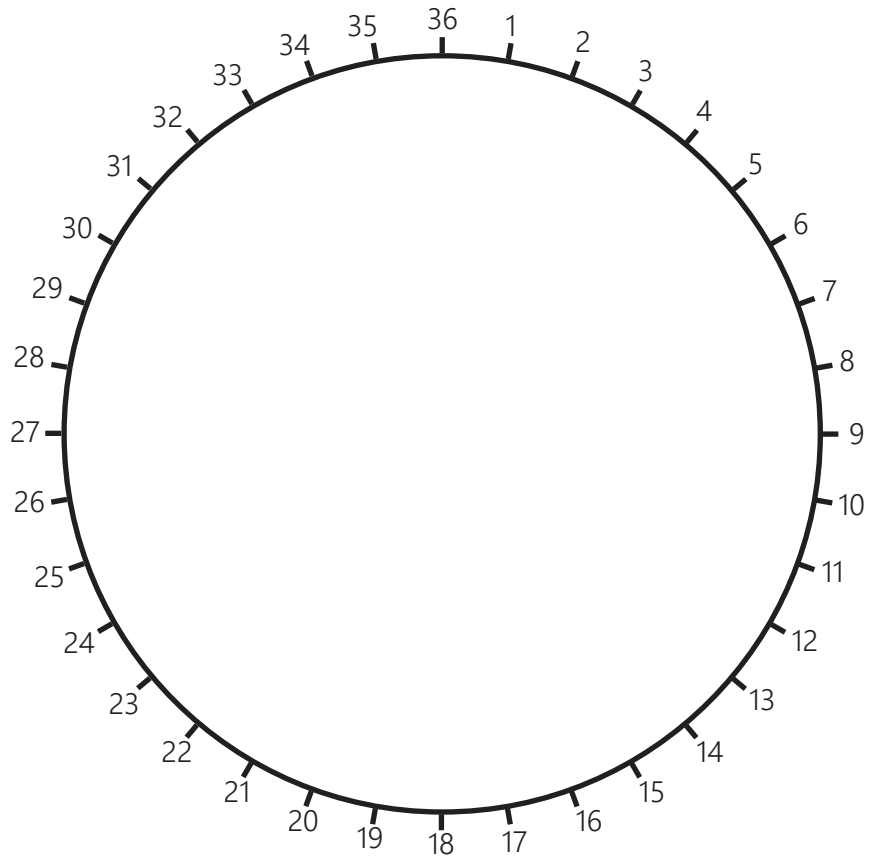
- The winner of the first race scored 1 point.
- The winner of the second race scored 2 point.
- The winner of the third race scored 4 point.
- The winner of the fourth race scored 8 point.
- The winner of the fifth race scored 16 point.
- The winner of the sixth race scored 32 point.

Then they added up all their points. Willow scored 11 more points than Harper. Can you work out who won each race?

When they tried this again, Harper scored 1 more point than Willow. Who won each of the races this time?

Curves

A curve called a Cardioid (can you guess what this shape will look like?) may be drawn by joining points marked along the circumference of a circle. Join the points according to the rule $n \rightarrow 2n$, i.e. 1 joins to 2, 2 to 4, 3 to 6, 4 to 8 etc. 19 joins to 38 ($36+2$), 20 to 40 ($36 + 4$). Stop when you reach 33 to 66 (i.e. $36 + 30$).



Answers

Fair and Square

Harper: 15 laps. Willow: 21 laps. Aria: 35 laps.

Muddled Medals

Several answers are possible. This is one:

Athlete	Gold	Silver	Bronze
The Fish	2	1	1
Lightning	2	1	1
Stamina	1	1	2

Curves

It will look heart-shaped.

Who Won the Medals?

Country	Gold	Silver	Bronze	Total Medals
Canada	45	31	33	109
England	27	28	32	87
Australia	24	33	27	84
New Zealand	5	6	9	20
Kenya	7	6	5	18
India	5	4	6	15
Scotland	3	6	5	14

Points for Winners

Willow won by 11 points by winning races 1, 3, and 6.
Harper won by 1 point by winning only race 6.

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