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Numbers, Numeration, Operations and Patterns

Mallard is a very orderly dog. In order, he chews on a bone, a shoe, a piece of bark and a rubber steak. He then repeats this sequence. If he repeats the whole sequence a number of times, what will be the twenty-second item chewed on?

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Numbers, Numeration, Operations and Patterns

Find the missing digits in the multiplication problem below.

$$\begin{array}{r} 8 \square 2 \\ \times \square 6 4 \\ \hline 3 3 \square 8 \\ 4 \square 9 2 0 \\ \square 3 2 8 0 0 \\ \hline \square 8 6, 0 \square 8 \end{array}$$

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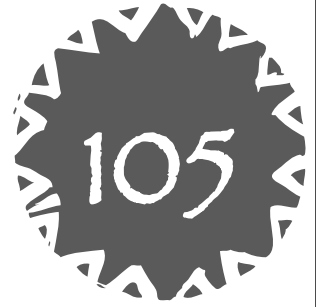


Measurement

You may have heard the story of how Hannibal crossed the Alps with an army and a number of elephants. To move all his supplies, he must have used carts as well as elephants.

Imagine that some of Hannibal's carts had three wheels, one in the front and two in the back. For safety, each had a spare wheel, and the wheels were rotated so that all four wheels got the same amount of wear.

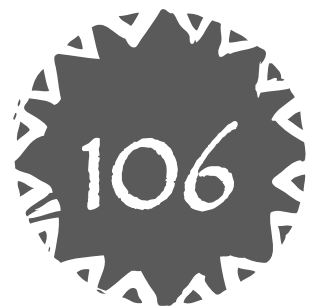
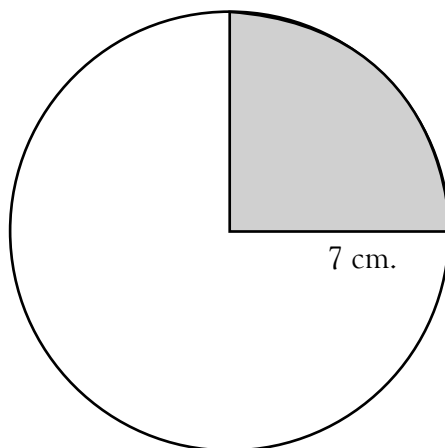
If Hannibal's entire route was 1000 kilometres long, how many kilometres of wear were put on each wheel?



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Measurement

What is the area of the shaded portion of the circle?



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Data Analysis, Statistics, Combinations and Probability

At a birthday party, there are three flavours of ice-cream: Fudge Ripple, Strawberry-Swirl and Chocolate Chip. Each guest can have one or two flavours on a cone.

How many possible combinations are there?



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Data Analysis, Statistics, Combinations and Probability

During the AFL football season, many people make predictions about who will win games. The newspaper asks three experts to predict which team will win each game. Four games are scheduled for tonight. Here are today's predictions for the winners of each game.

Expert 1: Geelong, Sydney, St Kilda and Carlton

Expert 2: Collingwood, Western Bulldogs, St Kilda and Geelong

Expert 3: Adelaide, Sydney, Western Bulldogs and Geelong

No one chooses Port Adelaide.

Who is scheduled to play whom?



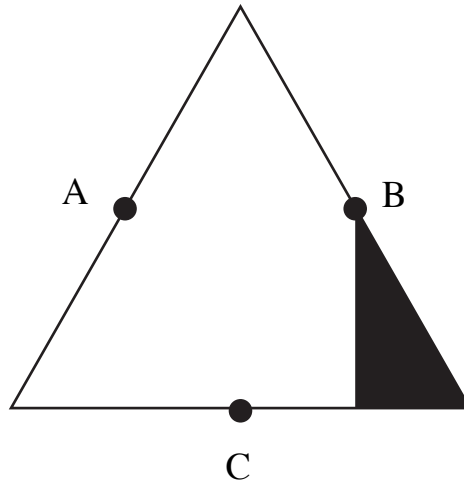
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Fractions, Ratios, Decimals and Percentages



Look closely at the equiangular equilateral triangle. Points A, B and C are midpoints. What is the ratio of the area of the large triangle to the area of the smaller, shaded right triangle?



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Fractions, Ratios, Decimals and Percentages

A tycoon left one half of his fortune to his wife, a quarter of his fortune to his only daughter, and one fifth of his fortune to a sister. The rest of his estate went to his beloved Irish wolfhound, Con.

If the tycoon left 5 million dollars to his dog, how much money did his wife inherit?



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