

Further Maths A-level

Summer Work for start in September 2026

Have a go at these problems.

Bring back your clearly written up solutions in September.

They are not meant to be easy, but they are all possible using the maths you have learned at GCSE!

Tornado alley



The severity of a tornado is measured on the Fujita scale.

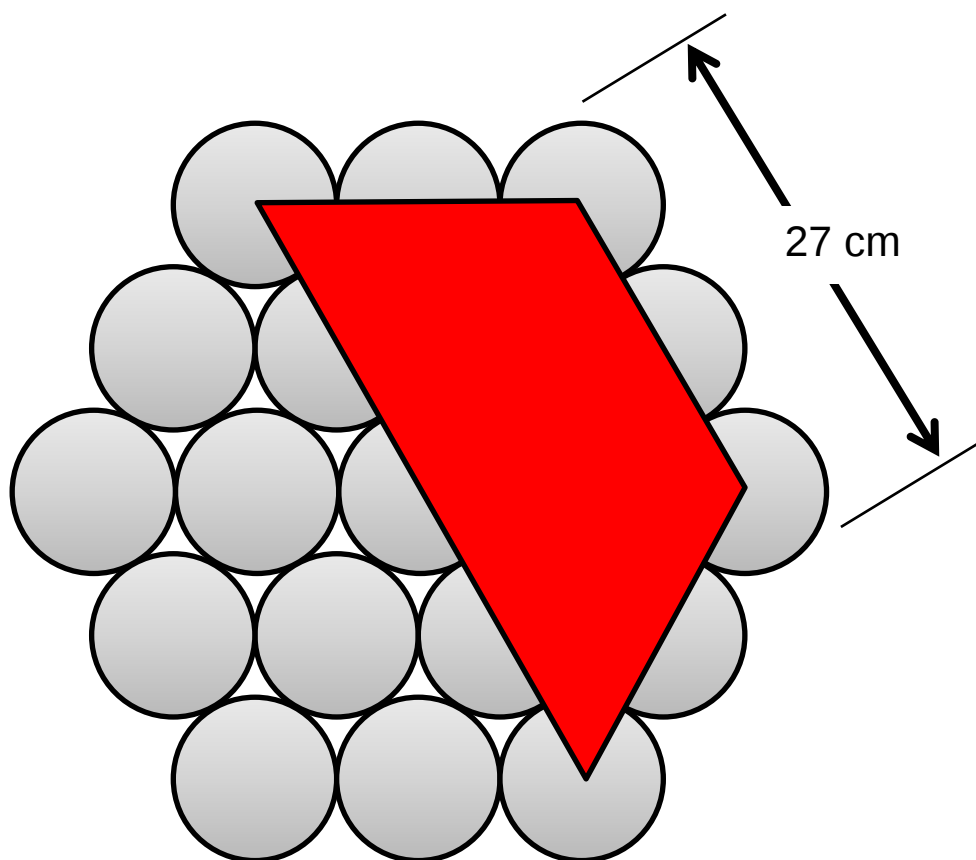
The most destructive tornadoes are given a rating of F5.

A reporter who researches the occurrence of tornadoes in the USA's tornado alley states, "In the next 20 years the chance that an F5 tornado will occur in Kansas is two out of seven."

Which of the statements below best matches the meaning of the reporter's statement?

- A) $20 \times \frac{2}{7} = 5.7$ so between 5 and 6 years from now there will be an F5 tornado in Kansas
- B) The likelihood that there will be an F5 tornado at some time during the next 20 years is lower than the likelihood of no F5 tornado.
- C) $\frac{2}{7}$ is less than $\frac{1}{2}$ so you can be sure there will not be an F5 tornado in Kansas at any time during the next 20 years.
- D) You cannot tell what will happen, because nobody can be sure when an F5 tornado will occur.

Hexabubble



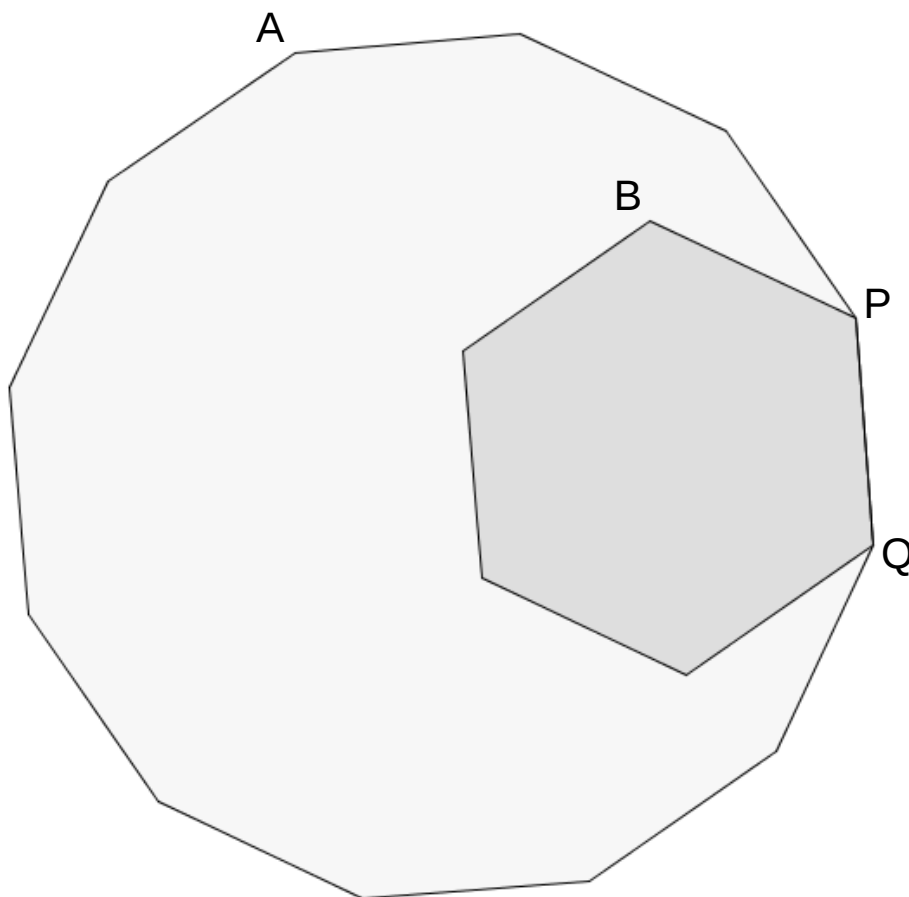
This diagram shows 19 identical circles arranged in a hexagon.

All of the vertices of the trapezium are in the centre of a circle.

Find the area of the trapezium.

Dodecagon and Hexagon

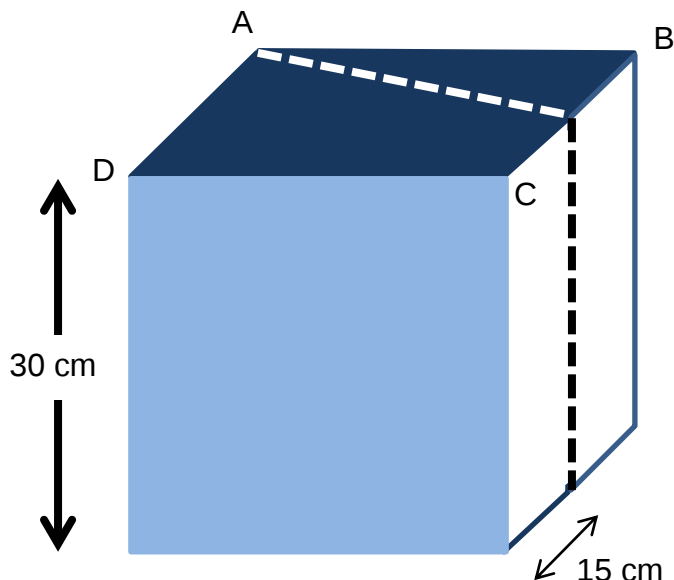
This diagram shows a regular dodecagon and a regular hexagon with a common side PQ.



Show that the points A, B and P all lie on the same straight line.

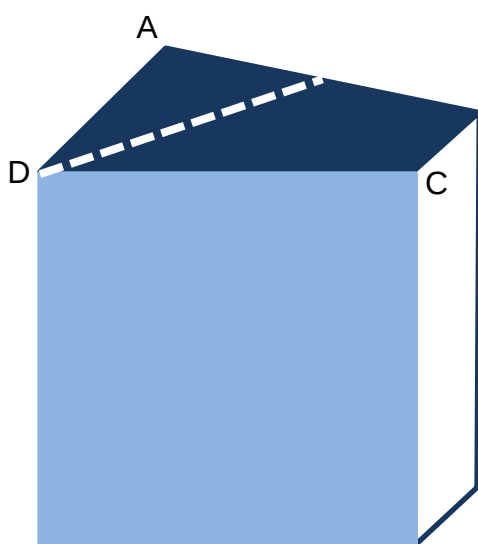
Cube Slice

A cube is sliced vertically along the line shown in the diagram and the smaller part is thrown away.

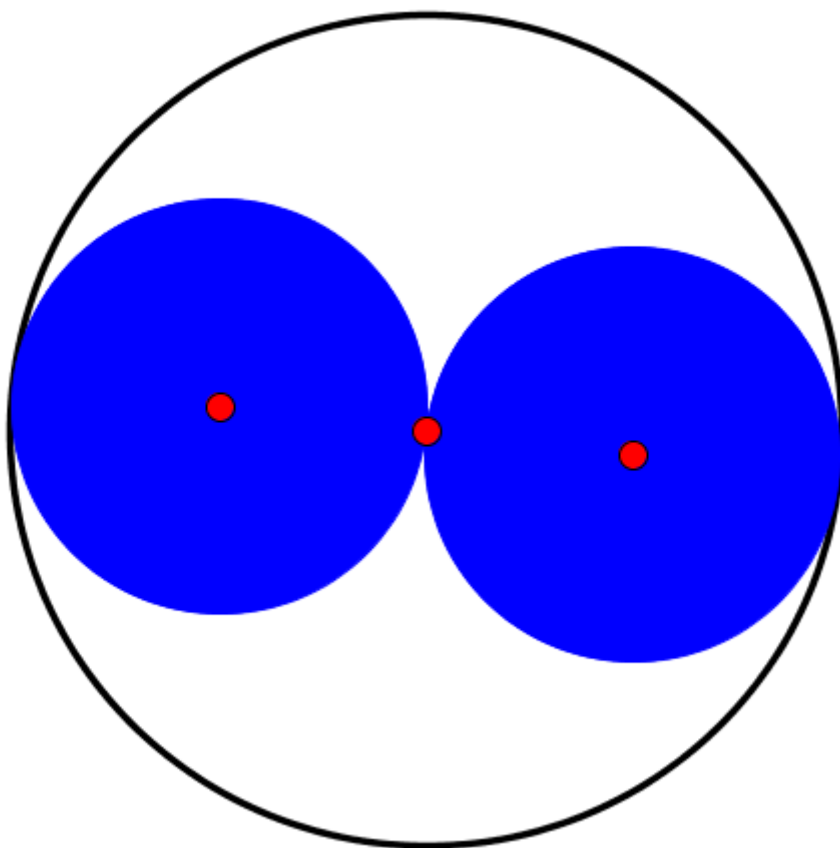


The resulting prism is going to be sliced vertically downwards again by a line going through corner D.

Where would the slice have to be to split the prism into two equal volumes?



Circly



What proportion of the large circle is shaded?

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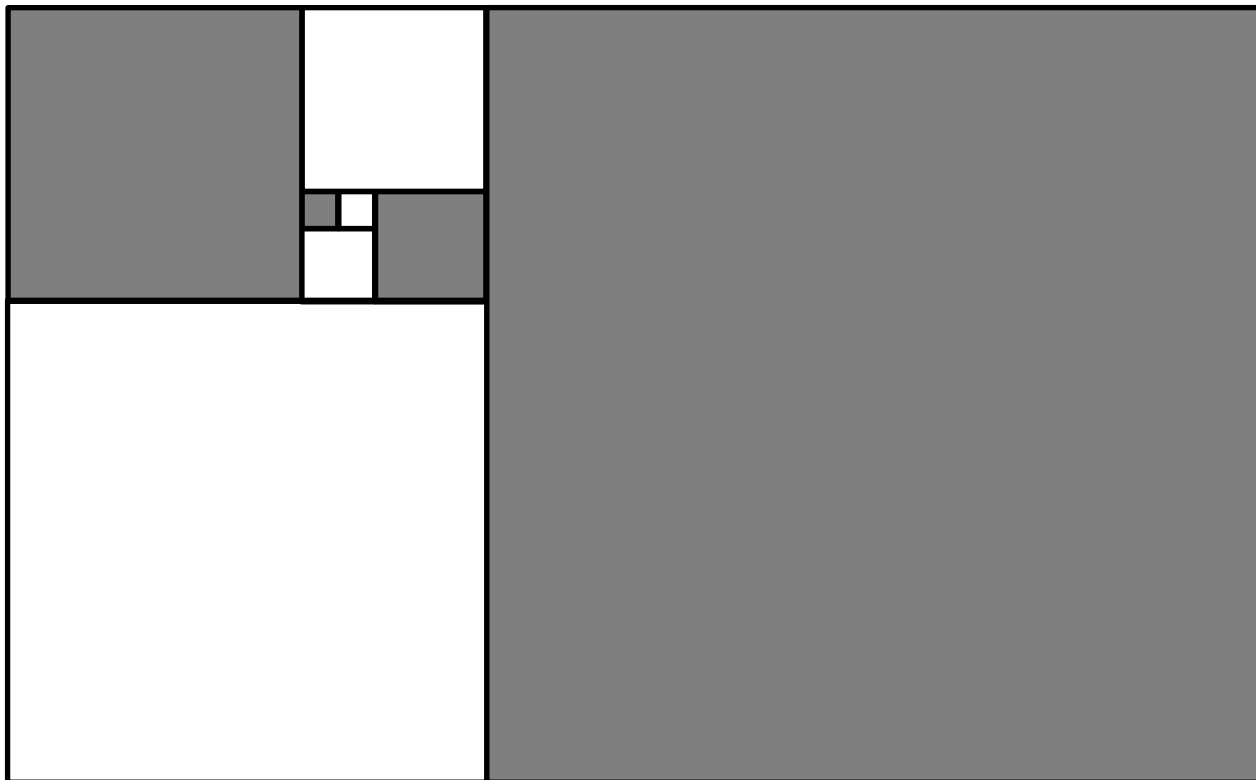


Always Fives

Marek is investigating even numbers. He finds out that if you pick an even number and multiply it by three and then subtract half of the original number, you always get a multiple of five.

Explain why this happens?

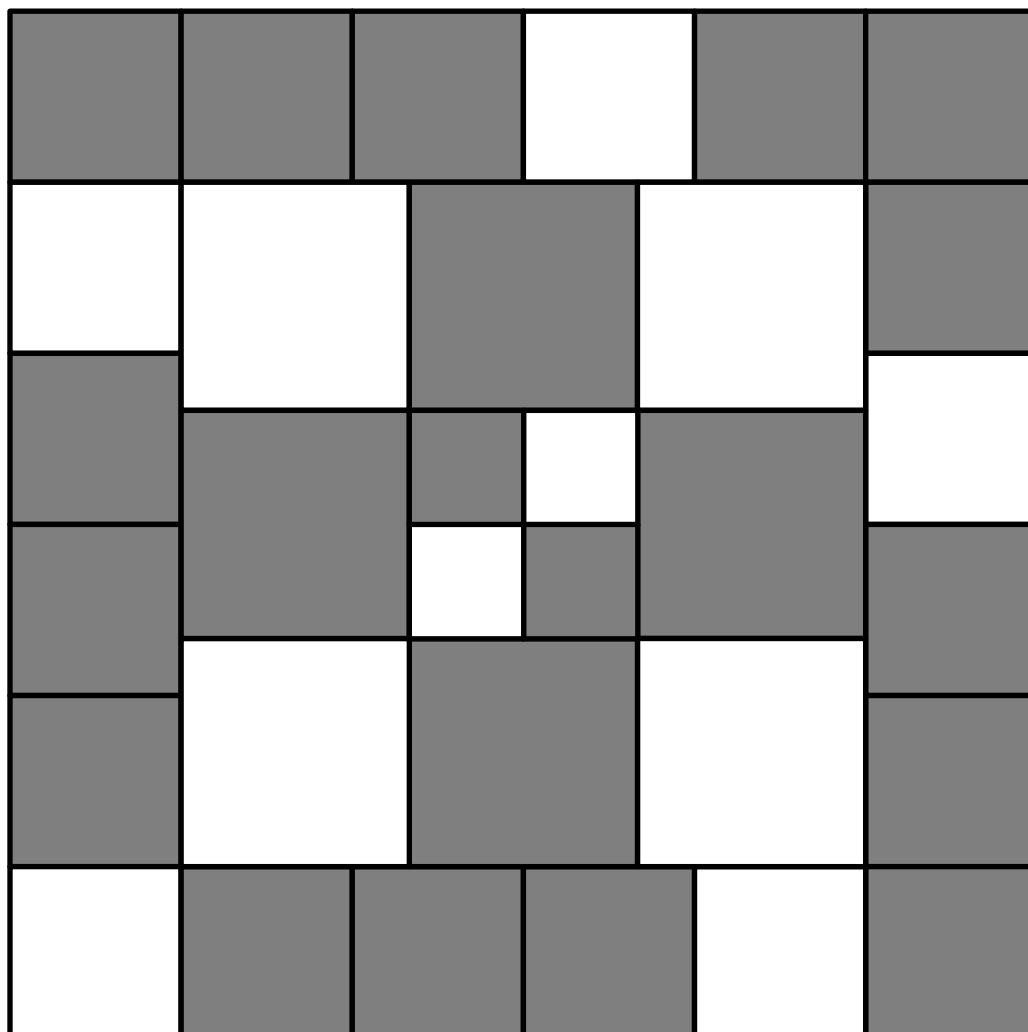
Shaded squares 2



This design is made up of squares.

What percentage of the design is shaded?

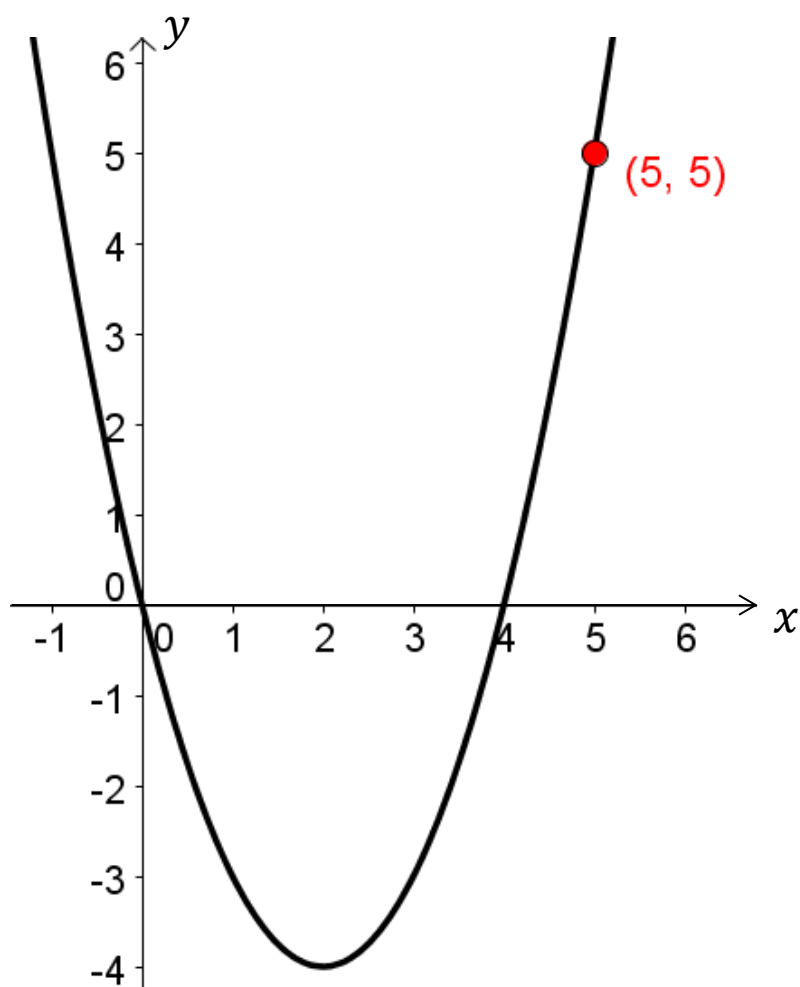
Shaded squares 1



This design is made up of squares.

What percentage of the design is shaded?

Mystery Quadratic



This is part of the graph of a quadratic function.

What is the equation of the graph?