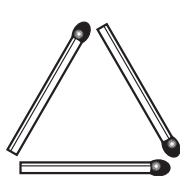
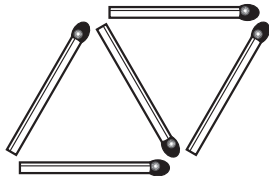


a^2	\sqrt{a}	$2b^2$	\sqrt{b}
$\frac{3\sqrt{b}}{2}$	$3b^2$	$\frac{\sqrt{a}}{10}$	$\frac{a^2}{5}$
b^2	$\frac{a^2}{10}$	$2\sqrt{b}$	$5\sqrt{a}$
$\frac{\sqrt{a}}{2}$	$3a^2$	$\frac{b^2}{2}$	$4\sqrt{b}$

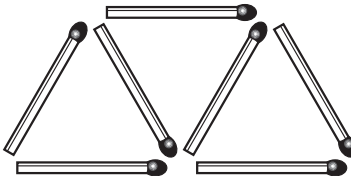
1 The terms of a sequence are based on patterns of matchsticks.



1 triangle
3 matchsticks



2 triangles
5 matchsticks



3 triangles
7 matchsticks

How many matchsticks will there be in the n th pattern?

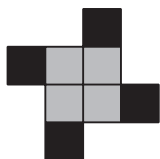
Darwish uses 35 matchsticks to make a pattern.

Which term of the sequence is based on this pattern?

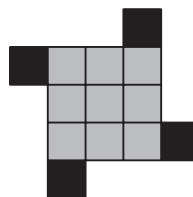
2 The terms of a sequence are based on patterns made from tiles.



pattern 1



pattern 2



pattern 3

How many tiles will there be in the n th pattern?

Noor uses 85 tiles to make a pattern.

Which term of the sequence is based on this pattern?

3 Find the n th term of each of these sequences:

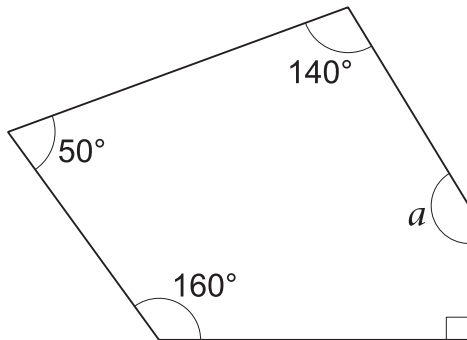
- a. 6, 10, 14, 18, 22, ...
- b. 8, 15, 22, 29, 36, ...
- c. -1, -5, -9, -13, -17, ...
- d. -15, -12, -9, -6, -3, ...
- e. $\frac{3}{4}, \frac{5}{9}, \frac{7}{14}, \frac{9}{19}, \frac{11}{24}, \dots$

Where possible, sketch one or more triangles to fit each description.

Mark the given angles and sides on each triangle.

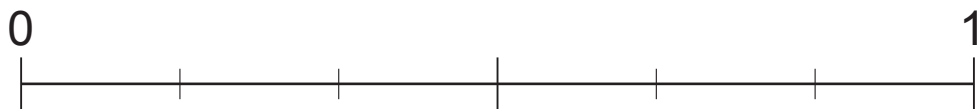
<p>1 A triangle with sides of 4 cm, 5 cm and 6 cm.</p>	<p>2 A triangle with two sides of 5 cm and an angle of 50°.</p>
<p>3 A triangle with sides of 6 cm and 7 cm and an angle of 70° between them.</p>	<p>4 A triangle with sides of 3 cm, 5 cm and 9 cm.</p>
<p>5 A triangle with angles of 40°, 60° and 80°.</p>	<p>6 A triangle with two sides of 5 cm and two angles of 50°.</p>
<p>7 A triangle with sides of 6 cm and 8 cm and an angle of 40° next to the 8 cm side but not next to the 6 cm side.</p>	<p>8 A triangle with angles of 50°, 70° and 90°.</p>

- 1 Calculate the size of the interior angle of a regular octagon.
- 2 Calculate the size of angle a in the polygon below.



- 3 The size of an exterior angle in a regular polygon is 20° .
How many sides does the polygon have?
- 4 The size of an interior angle in a regular polygon is 162° .
How many sides does the polygon have?
- 5 Given that the sum of the interior angles of a triangle is 180° , prove that the sum of the exterior angles of a triangle is 360° .

Type of number	Possible numbers on dice	Total out of 6	Probability
even			
odd			
prime			
multiple of 3			
less than 5			
square			



- 1** Three friends decide to play a game with a dice.
When the dice is thrown, Dana wins if the number is 1 or 2, Asma wins if the number is 3 or 4. Otherwise, Moza wins.

Is the game fair? Explain your answer.

- 2** A drawing pin can fall on its end or on its side.

Someone threw a drawing pin 40 times. It landed on its side 24 times and on its end 16 times. Using these results:

- work out an estimate for the probability of a drawing pin falling on its side;
- work out an estimate for the probability of a drawing pin falling on its end.

The drawing pin is now thrown 100 times.

Estimate the number of times that it will fall on its side.

- 3** There are 6 discs in a bag. Each disc has a number on it. The numbers on four of the discs are 2, 3, 12 and 14.

I am going to take a disc at random from the bag.

The probability that it will show a multiple of 7 is $\frac{1}{3}$.

What numbers might be on the other two discs?

- 4** In each box of cakes there is a free gift of a card.
You cannot tell which card will be in a box. Each card is equally likely.
There are four different cards: A, B, C or D

- Saad needs card A. His brother Masood needs cards C and D.
They buy one box of cakes.

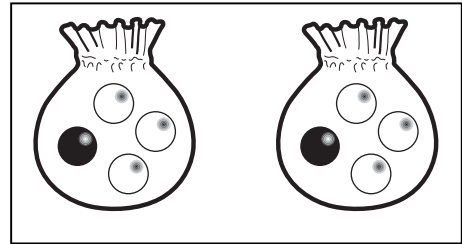
What is the probability that the card is one that Saad needs? What is the probability that the card is one that Masood needs?

- Then their mother opens the box.
She tells them the card is not card A.

Now what is the probability the card is one that Saad needs?

What is the probability that the card is one that Masood needs?

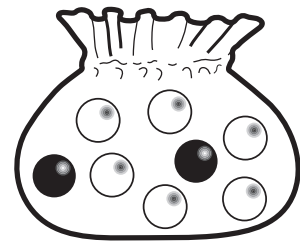
Each bag has three white balls and one black ball.



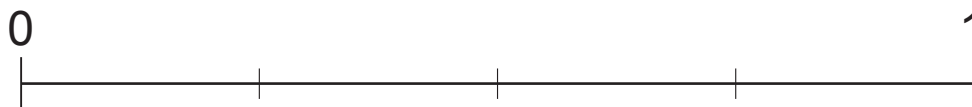
A ball is taken from one of the bags.

What is the probability that it is a black ball?

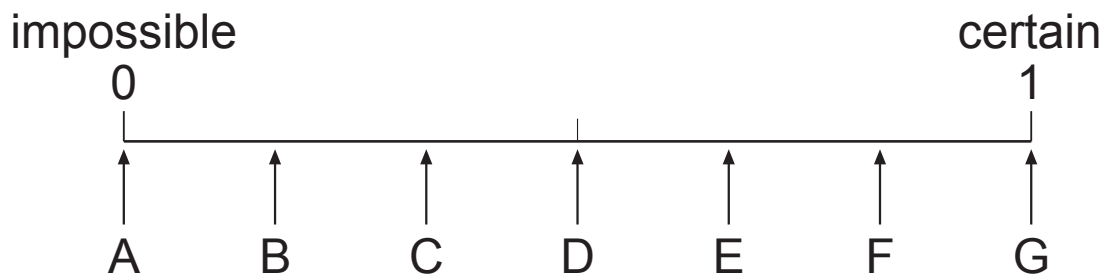
All the balls from both bags are mixed together in a new bag.



Put a cross (×) on this line to show the probability of taking out a black ball from the new bag.

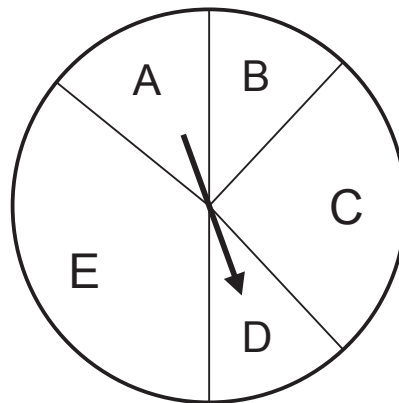


A fair dice has the numbers 2, 2, 2, 2, 5 and 5 on it. Circle the arrow that shows the probability of rolling a 2.



Here is a spinner

What is the probability
that the arrow stops in E?



Show this probability by putting a cross (✕) on the probability line below.

