

Maths Knowledge Organiser

YEAR 7 – PART 6

Key Language

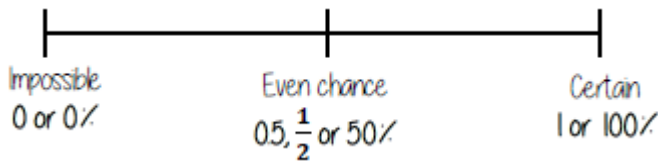
1	Probability	the likelihood of an event happening.
2	P(A)	the probability that event A will occur.
3	Sample space	the set of all possible outcomes of an experiment.
4	Venn diagram	a diagram using circles or other shapes, to show the relationship between sets.
5	Set	collection of things. You write sets inside curly brackets { }.
6	Element	each item in a set is called an element.
7	Universal set	has this symbol ξ this means EVERYTHING in the Venn diagram is in this set.
8	Intersection	the overlapping part of a Venn diagram (AND \cap).
9	Union	the set made by combining the elements of two sets.(OR \cup).
10	Mutually Exclusive	events that do not occur at the same time.
11	Bias	a built-in error that makes all values wrong (unequal) by a certain amount, e.g. a weighted dice.
12	Fair	there is zero bias, and all outcomes have an equal likelihood.
13	Random	something happens by chance and is unable to be predicted.
14	Associative	means we can complete the calculation in any order $(4 + 7) + 1 = 4 + (7 + 1)$ $11 + 1 = 4 + 8$
15	Commutative	adding is commutative because $2 + 7 = 9$ and $7 + 2 = 9$ It doesn't matter which way round you add Subtracting is not commutative because $5 - 2 = 3$ but $2 - 5 = -3$
16	Multiples	of a number are found by multiplying that number by an integer.
17	Factors	When a number can written as a product of two numbers, these are factors .
18	Lowest common multiple (LCM)	The smallest number that is a multiple of two numbers e.g. LCM of 20 and 12 is 60.
19	Highest common factor (HCF)	The largest number that is a factor of two numbers e.g. HCF of 20, and 12 is 4.
20	Counter example	an example that proves another statement false
21	Conjecture	a statement that could be true or false, is yet to be proved.
22	Proof	a logical mathematical argument used to show the truth of a mathematical statement.



Know



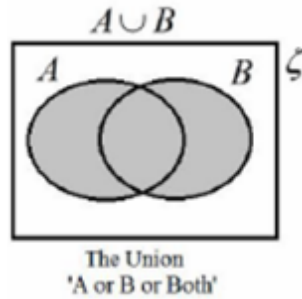
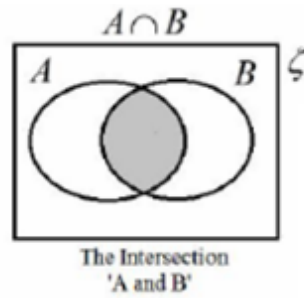
Probability



The more **likely** an event the further up the probability it will be in comparison to another event. (It will have a probability closer to 1)

Probability is always a value between 0 and 1. (or 0% - 100%)

Probability can be a fraction, decimal or percentage value. (never write as a ratio)

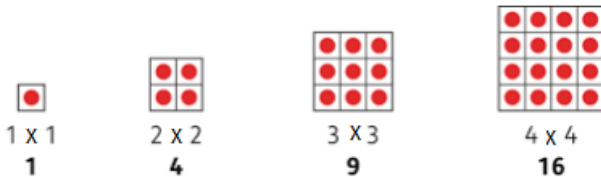


- ♠ ♣ ♥ ♦
- 52 cards in a pack
- 4 suits in a pack
- 13 Spades (black)
- 13 Clubs (black)
- 13 Hearts (red)
- 13 Diamonds (red)
- Suits contain:
- Ace, 2, 3, 4, 5,
- 6, 7, 8, 9, 10,
- Jack, Queen,
- King

Types of Number

Square numbers: The result of multiplying a number by itself.

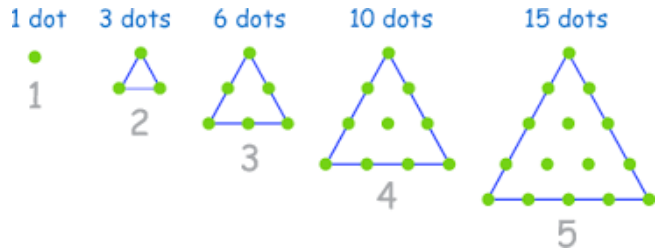
The first 10 square numbers are: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100.



Two consecutive triangle numbers add to make a square number.

Triangle numbers

A number that can make a triangular dot pattern. Each row is 1 more than the last row.



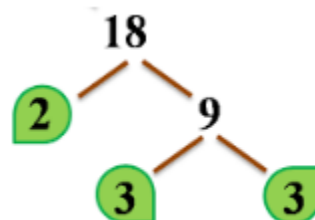
Prime number:

A number that has exactly two factors, itself and one.

Prime numbers to 50 are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47.

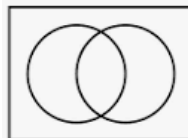


You can use a **prime factor tree** to help find the prime factors






1. What does $P(B)$ mean?
2. Write down the first 5 multiples of 5.
3. What is the fourth prime number?
4. What are the factors of 20?
5. Explain why 10 is not a prime number.
6. Draw a diagram to show the 3rd triangle number – what is the 3rd triangle number?
7. What happens when you add two consecutive triangle numbers?
8. What is the Highest common factor of 4 and 6?.
9. What type of brackets do we use to list a set.
10. Shade this Venn diagram to show A and B ($A \cap B$)
11. How many Hearts are there in a pack of cards?
12. How many 6's are there in a pack of cards?
13. List the four different suits on a pack of cards.
14. How many elements are in this set? $\{3, 5, 7, 8, 9\}$
15. What does fair mean in probability?
16. What do we call it when there is a built-in error that makes all values wrong?
17. James says the probability of an event happening is 1.2. Why is he wrong?
18. How should we write a probability?
19. Is multiplication commutative? Give an example.
20. Is division commutative? Give an example.
21. What does associative mean?
22. What does mutually exclusive mean?
23. What do we call the set of all possible outcomes of an experiment?
24. What can we use to find the prime factors of a number?
25. If an event is more likely to happen, would it be closer to 0 or 1 on the probability scale?



ANSWERS

1. The probability of event B happening.
2. 5, 10, 15, 20, 25
3. 7
4. 1, 2, 4, 5, 10, 20
5. It has more than 2 factors (1, 2, 5, 10)
6. 6 
7. You get a square number.
8. 2
9. Curly $\{ \}$
10. .
11. 13
12. 4
13. Heart, spades, clubs and diamonds
14. 5
15. zero bias, and all outcomes have an equal likelihood
16. Bias
17. Probability is between 0 and 1
18. As a fraction, decimal or percentage
19. Yes $3 \times 4 = 4 \times 3$
20. No $10 \div 2 = 2 \div 10$
21. means we can complete the calculation in any order
22. events that do not occur at the same time.
23. Sample space
24. Prime factor tree
25. 1

