



Sets

Date: _____

Sit down with a pen and paper.



Calculator allowed



Starter

- 1 What is the probability the spinner lands on a red?
- 2 What is the probability **the spinner** lands on an even number?
- 3 What is the probability the spinner lands on a 6?
- 4 What is the probability the spinner lands on a yellow or green?
- 5 How many different outcomes are there if you spin it twice?

Spinner 1



$P(\text{outcome}) =$ *Find the probability of (outcome)*

*and means \times
or means $+$*

A $P(A) =$

Both spinners are spun.

B $P(\text{Red}) =$

F $P(4 \text{ and } A) =$

C $P(\text{Red or } A) =$

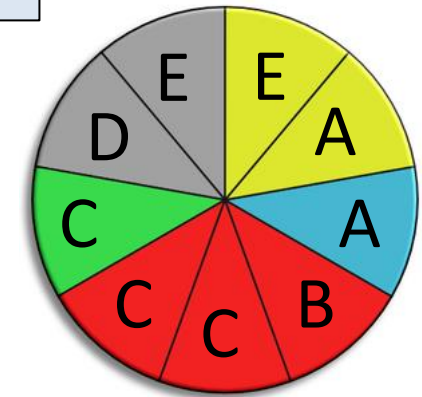
G $P(\text{Both red}) =$

D $P(\text{Vowel}) =$

H $P(\text{At least one yellow}) =$

E *How many different outcomes are there?*

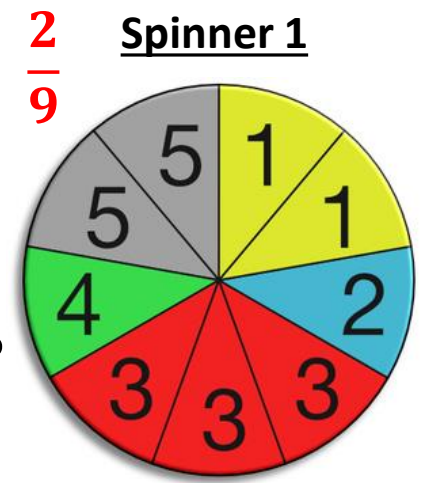
Spinner 2



Sample space diagram

Answers

- 1 What is the probability the spinner lands on a red? $\frac{3}{9} = \frac{1}{3}$
- 2 What is the probability **the spinner** lands on an even number? $\frac{2}{9}$
- 3 What is the probability the spinner lands on a 6? 0
- 4 What is the probability the spinner lands on a yellow or green? $\frac{3}{9} = \frac{1}{3}$
- 5 How many different outcomes are there if you spin it twice? $5 \times 5 = 25$



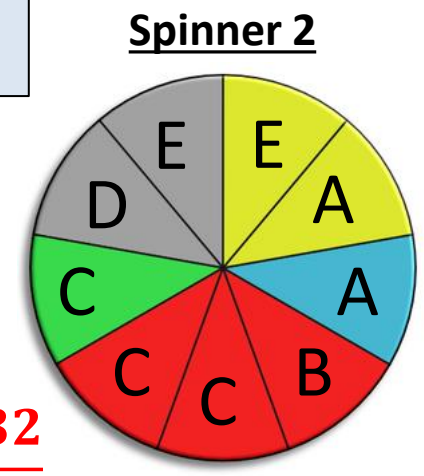
P(outcome) = **Find the probability of (outcome)**

and means ×
or means +

- A $P(A) = \frac{2}{9}$
- B $P(\text{Red}) = \frac{3}{9} = \frac{1}{3}$
- C $P(\text{Red or A}) = \frac{5}{9}$
- D $P(\text{Vowel}) = \frac{4}{9}$

Both spinners are spun.

- F $P(4 \text{ and } A) = \frac{1}{9} \times \frac{2}{3} = \frac{2}{27}$
- G $P(\text{Both red}) = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$
- H $P(\text{At least one yellow}) = \frac{32}{81}$



- E *How many different outcomes are there?* 8

Sample space diagram

Sample space diagram

Back

	1		1		2		3		3		3		4		5		5	
E	E	1	E	1	E	2	E	3	E	3	E	3	E	4	E	5	E	5
A	A	1	A	1	A	2	A	3	A	3	A	3	A	4	A	5	A	5
A	A	1	A	1	A	2	A	3	A	3	A	3	A	4	A	5	A	5
B	B	1	B	1	B	2	B	3	B	3	B	3	B	4	B	5	B	5
C	A	1	A	1	A	2	A	3	A	3	A	3	A	4	A	5	A	5
C	C	1	C	1	C	2	C	3	C	3	C	3	C	4	C	5	C	5
C	C	1	C	1	C	2	C	3	C	3	C	3	C	4	C	5	C	5
D	D	1	D	1	D	2	D	3	D	3	D	3	D	4	D	5	D	5
E	E	1	E	1	E	2	E	3	E	3	E	3	E	4	E	5	E	5



Literacy

Sets A collection

{1,2,3,4,5,6 ... }

Arrows point from this text to the opening and closing brackets of the set notation above.

Brackets are used to show items in a set.

Arrows point from this text to the ellipsis in the set notation above.

These three dots ... are called ellipsis, and mean “continue on”.

Set A {7,14,21,28 ... }

Set B {8,16,24,32 ... }

- 1 Is the number 71 in set A?
- 2 What is the next number in set B?
- 3 Is the number 111 in set B? **Why?**
- 4 What is the first number that belongs to both sets?
- 5 Is 560 in both sets?
- 6 Is 100 in either set?
- 7 What is the second number that belongs to both sets?
- 8 Is the number 5656 in both sets? **Why?**

Set A {7,14,21,28 ... }

Set B {8,16,24,32 ... }

- 1 Is the number 71 in set A? **No**
- 2 What is the next number in set B? **40**
- 3 Is the number 111 in set B? **Why?** **No, all the numbers in set B are even.**
- 4 What is the first number that belongs to both sets? **56**
- 5 Is 560 in both sets? **Yes**
- 6 Is 100 in either set? **No**
- 7 What is the second number that belongs to both sets? **112**
- 8 Is the number 5656 in both sets? **Why?** **Yes, it is in the 56 times table.
 $101 \times 56 = 5656$**



Literacy

Universal set ξ

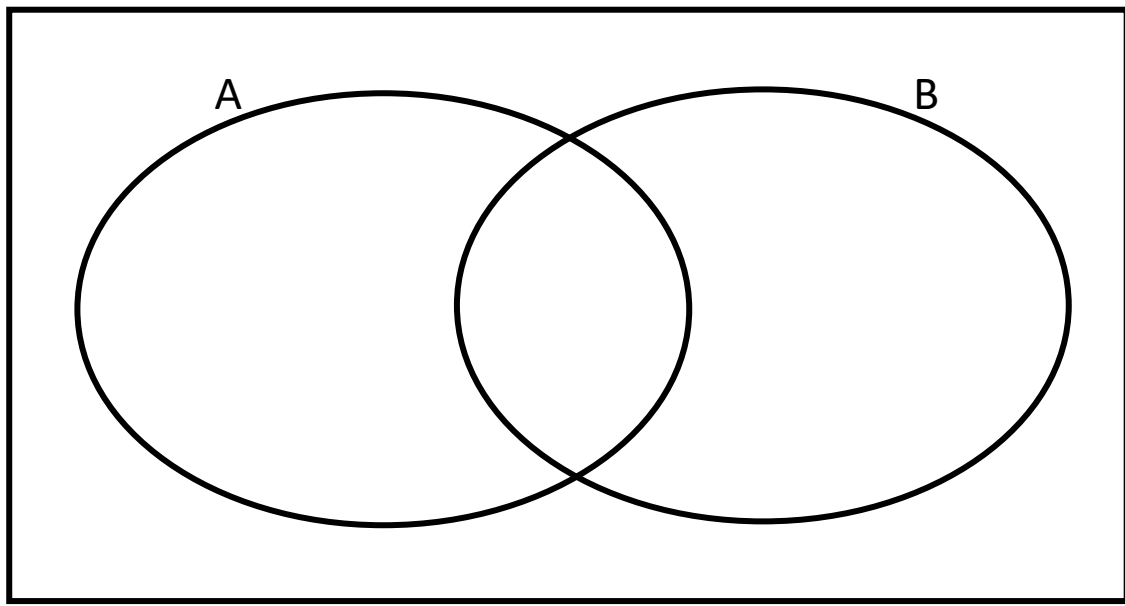
The items we are considering.

ξ {*Integers 1 – 20*}

Whole numbers \nearrow

Set A {*Factors of 20*}

Set B {*Square numbers*}



Place the numbers 1 to 20 in the **Venn diagram**.



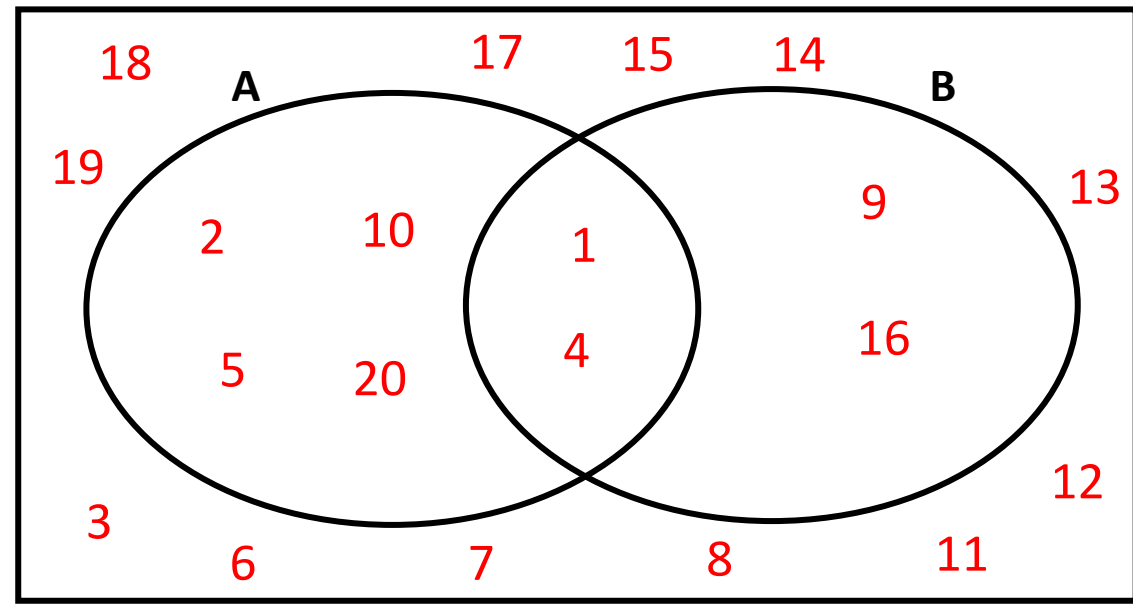
Literacy

Universal set ξ The items we are considering.

ξ {*Integers 1 – 20*}

Set A {*Factors of 20*}

Set B {*Square numbers*}





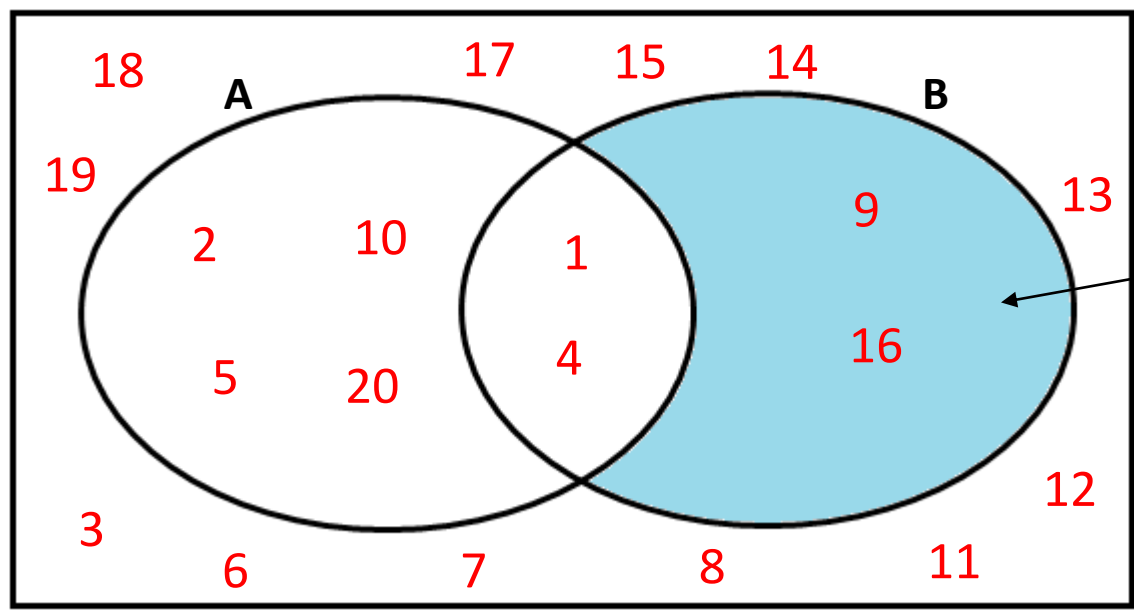
Literacy

Universal set ξ The items we are considering.

ξ {*Integers 1 – 20*}

Set A {*Factors of 20*}

Set B {*Square numbers*}



Just in set B



Literacy

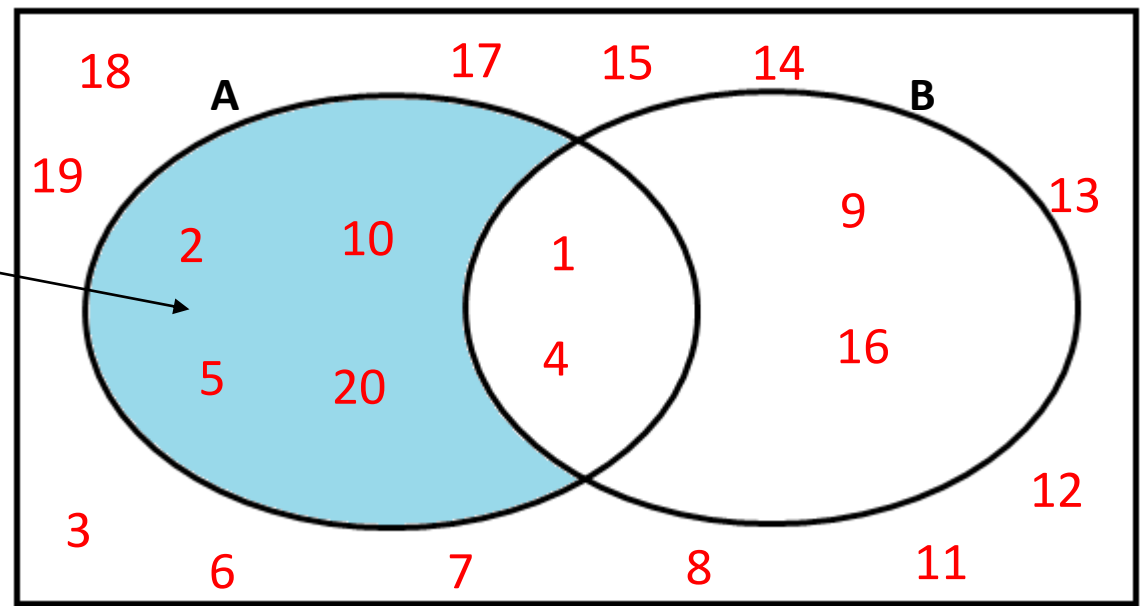
Universal set ξ The items we are considering.

ξ {*Integers 1 – 20*}

Set A {*Factors of 20*}

Set B {*Square numbers*}

Just in set A





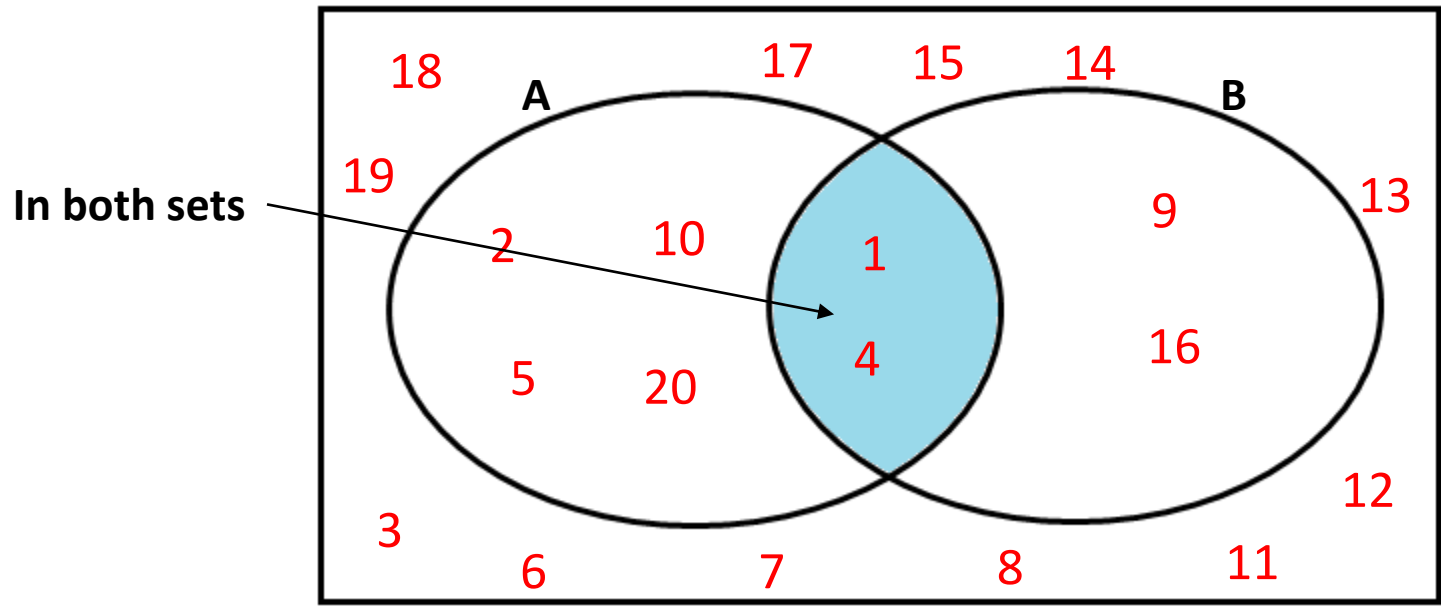
Literacy

Universal set ξ The items we are considering.

ξ {*Integers 1 – 20*}

Set A {*Factors of 20*}

Set B {*Square numbers*}





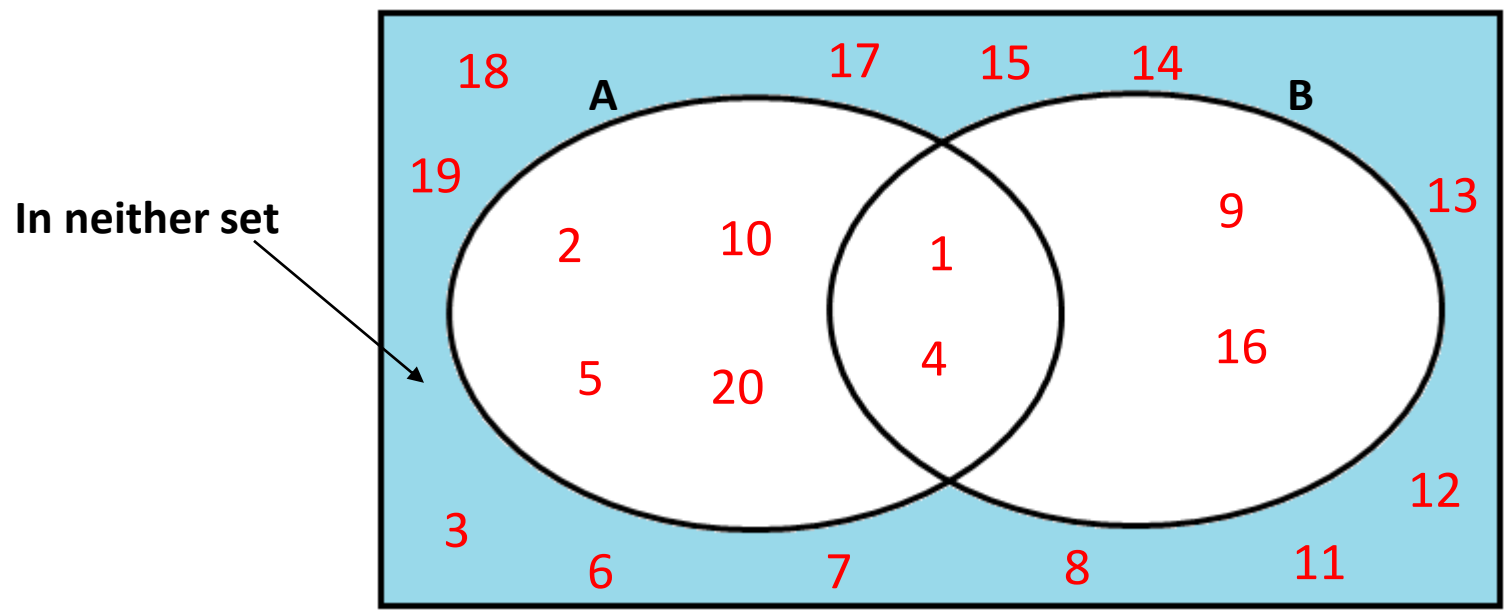
Literacy

Universal set ξ The items we are considering.

ξ {*Integers 1 – 20*}

Set A {*Factors of 20*}

Set B {*Square numbers*}



Questions

A computer picks a number at random from the numbers 1 to 20.

1 What is the probability of getting a 4?

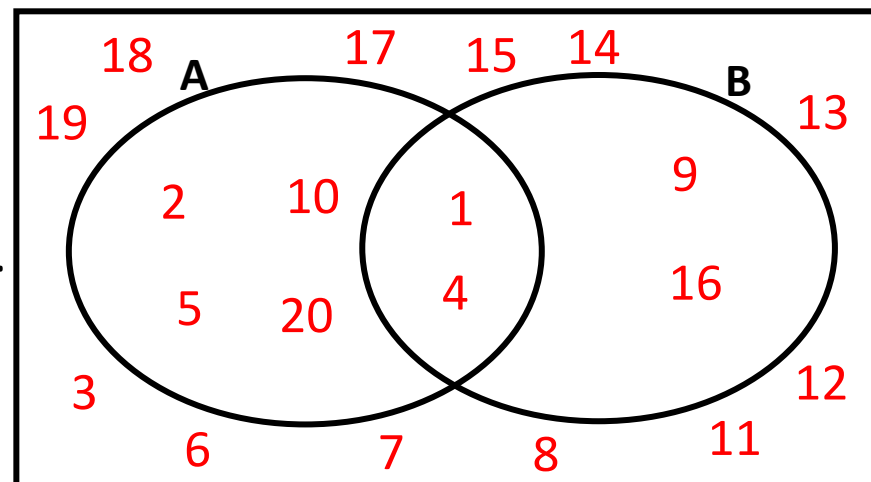
We can use notation to ask the same question.

1 $P(4) =$

2 $P(\text{factor of } 20) =$

3 $P(\text{square number}) =$

4 $P(\text{factor of } 20 \text{ that is a square number}) =$



Extra

$P(A|B)$ = What is the probability of the number being in set A given it is in set B.

5 $P(A|B) =$

6 $P(B|A) =$

Answers

A computer picks a number at random from the numbers 1 to 20.

1 What is the probability of getting a 4?

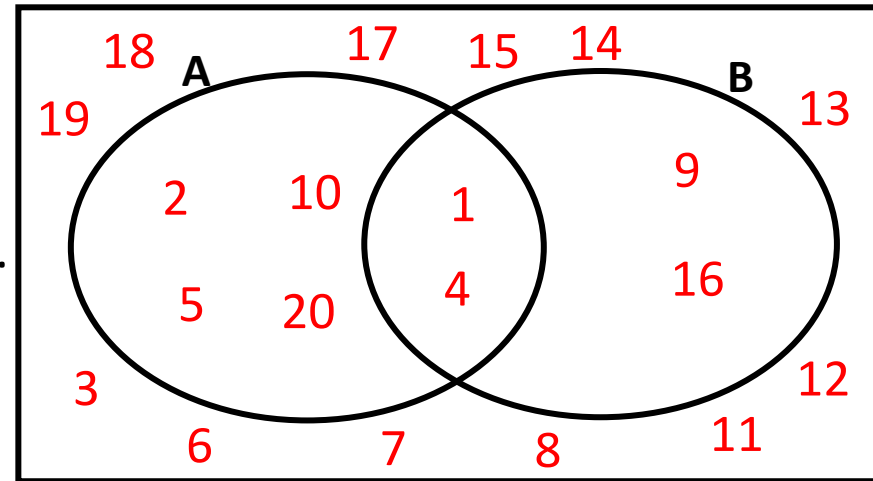
We can use notation to ask the same question.

1 $P(4) = \frac{1}{20}$

2 $P(\text{factor of } 20) = \frac{6}{20}$

3 $P(\text{square number}) = \frac{4}{20}$

4 $P(\text{factor of } 20 \text{ that is a square number}) = \frac{2}{20}$



Extra

$P(A|B)$ = What is the probability of the number being in set A given it is in set B.

5 $P(A|B) = \frac{2}{4}$ *If we know it is a square number then 2 of the 4 square numbers are factors of 20.*

6 $P(B|A) = \frac{2}{6}$

Questions

ξ {*Integers 1 – 20*}

Set A {*Factors of 24*}

Set B {*Prime numbers*}

1 Draw a Venn diagram of this information.

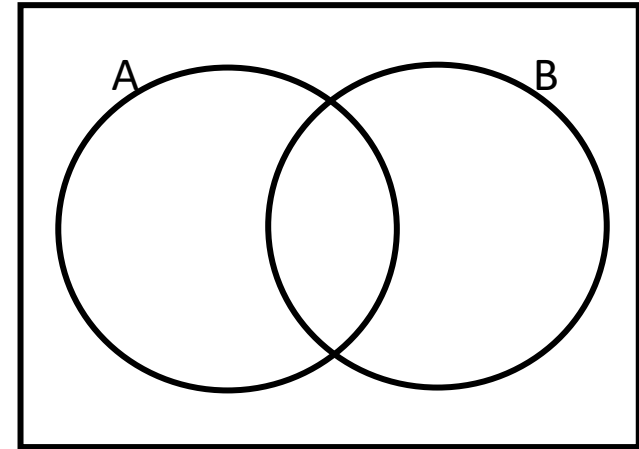
A computer picks a number at random from the numbers 1 to 20.

2 $P(\text{factor of 24}) =$

3 $P(\text{prime number}) =$

4 $P(\text{factor of 24 and prime}) =$

5 $P(\text{neither factor of 24 or prime}) =$



⊗ $P(A|B) =$

⊗ $P(B|A) =$

ξ {Integers 1 – 20}

Set A {Factors of 24}

Set B {Prime numbers}

1 Venn diagram.

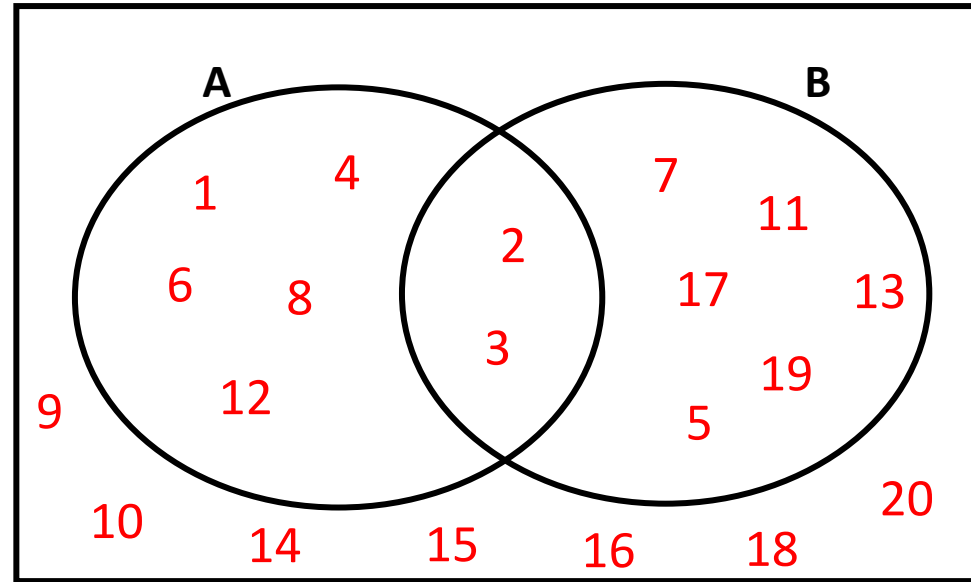
A computer picks a number at random from the numbers 1 to 20.

2 $P(\text{factor of 24}) = \frac{7}{20}$

3 $P(\text{prime number}) = \frac{8}{20}$

4 $P(\text{factor of 24 and prime}) = \frac{2}{20}$

5 $P(\text{neither factor of 24 or prime}) = \frac{7}{20}$



⊕ $P(A|B) = \frac{2}{8}$

⊕ $P(B|A) = \frac{2}{7}$

Well done for completing the lesson.



Reflections

A large, empty rounded rectangular box with a black border, intended for students to write their reflections.