

Episode 01 – Syllogisms

European section – Season 2

Syllogism 1

All men are mortal.

Socrates is a man.

Socrates is mortal.

Syllogism 1

All men are mortal.
Socrates is a man.
Socrates is mortal.

Syllogism 2

No mammal has feathers.
All horses are mammals.
No horse has feathers.

Syllogism 1

All men are mortal.
Socrates is a man.
Socrates is mortal.

Syllogism 2

No mammal has feathers.
All horses are mammals.
No horse has feathers.

Syllogism 3

No lazy people pass exams.
Some students pass exams.
Some students are not lazy.

Syllogism 4

All cats are black.

Victoria is a white cat.

Victoria is a black cat.

Syllogism 4

All cats are black.

Victoria is a white cat.

Victoria is a black cat.

Syllogism 5

All fruit is nutritious.

All fruit is tasty.

Some tasty things are nutritious.

Syllogism 4

All cats are black.

Victoria is a white cat.

Victoria is a black cat.

Syllogism 5

All fruit is nutritious.

All fruit is tasty.

Some tasty things are nutritious.

Syllogism 6

Some cats have no tails.

All cats are mammals.

Some mammals have no tails.

Syllogism 7

Some small birds live on honey.

All birds that live on honey are colourful.

Some colourful birds are small.

Syllogism 7

Some small birds live on honey.
All birds that live on honey are colourful.
Some colourful birds are small.

Syllogism 8

No homework is fun.
Some reading is homework.
Some reading is not fun.

Syllogism 7

Some small birds live on honey.
All birds that live on honey are colourful.
Some colourful birds are small.

Syllogism 8

No homework is fun.
Some reading is homework.
Some reading is not fun.

Syllogism 9

All kittens are playful.
Some pets are kittens.
Some pets are playful.

Syllogism 10

No healthy food is fattening.

All cakes are fattening.

No cakes are healthy.

Syllogism 10

No healthy food is fattening.
All cakes are fattening.
No cakes are healthy.

Syllogism 11

All informative things are useful.
Some websites are not useful.
Some websites are not informative.

Syllogism 10

No healthy food is fattening.
All cakes are fattening.
No cakes are healthy.

Syllogism 11

All informative things are useful.
Some websites are not useful.
Some websites are not informative.

Syllogism 12

All the industrious boys in this school have red hair.
Some of the industrious boys in this school are boarders.
Some boarders in this school have red hair.

Example (1)

All multiples of 12 are multiples of 4.

All multiples of 4 are even.

Therefore, all multiples of 12 are even.

Example (1)

All multiples of 12 are multiples of 4.

All multiples of 4 are even.

Therefore, all multiples of 12 are even.

Example (2)

No reptiles have fur.

All snakes are reptiles.

No snakes have fur.

Definition

A *syllogism* is a logical argument in which one proposition, the *conclusion*, is implied by two other propositions, the *premises*.

A (universal affirmative) : All S are P.
“All humans are mortal.”

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“All humans are mortal.”

E (universal negative) : All S are not P.

“All humans are not perfect.” or

“No humans are perfect.”

A (universal affirmative) : All S are P.

“All humans are mortal.”

E (universal negative) : All S are not P.

“All humans are not perfect.” or

“No humans are perfect.”

I (particular affirmative) : Some S are P.

“Some humans are healthy.”

A (universal affirmative) : All S are P.

“All humans are mortal.”

E (universal negative) : All S are not P.

“All humans are not perfect.” or

“No humans are perfect.”

I (particular affirmative) : Some S are P.

“Some humans are healthy.”

O (particular negative) : Some S are not P.

“Some humans are not clever.”

- S is the subject of the conclusion ;
- P is the predicate of the conclusion ;
- M is the middle term.

The major premise links M with P. The minor premise links M with S.

- S is the subject of the conclusion ;
- P is the predicate of the conclusion ;
- M is the middle term.

The major premise links M with P. The minor premise links M with S.

The 4 figures

	Figure 1	Figure 2	Figure 3	Figure 4
Major premise	M-P	P-M	M-P	P-M
Minor premise	S-M	S-M	M-S	M-S
Conclusion	S-P	S-P	S-P	S-P

The total number of possible types of syllogism is $4 \times 4 \times 4 \times 4 = 256$.

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The 19 valid forms of syllogisms

Figure 1	Figure 2	Figure 3	Figure 4
Barbara	Cesare	Darapti	Bramantip
Celarent	Camestres	Disamis	Camenes
Darii	Festino	Datisi	Dimaris
Ferio	Baroco	Felapton	Fesapo
		Bocardo	Fresison
		Ferison	

Major premise	No reptiles have fur.	
Minor premise	All snakes are reptiles.	
Conclusion	No snakes have fur.	

Subject Middle term Predicate

Structure Figure **Type**

Major premise	No reptiles have fur.	E
Minor premise	All snakes are reptiles.	A
Conclusion	No snakes have fur.	E

Subject Middle term Predicate

Structure Figure **Type**

Major premise	No reptiles have fur.	E
Minor premise	All snakes are reptiles.	A
Conclusion	No snakes have fur.	E

Subject Middle term Predicate

Structure Figure **Type**

Major premise	No reptiles have fur.	E
Minor premise	All snakes are reptiles.	A
Conclusion	No snakes have fur.	E

Subject Middle term Predicate

Structure Figure Type

Major premise	No reptiles have fur.	E
Minor premise	All snakes are reptiles.	A
Conclusion	No snakes have fur.	E

Subject Snakes Middle term Reptiles Predicate Fur

Structure MP SM SP Figure 1 Type Celarent

Major premise	
Minor premise	
Conclusion	

Subject Middle term Predicate

Structure Figure **Type**

Example (Valid but not true)

All penguins have pink stripes.

All math teachers are penguins.

Therefore, all math teachers have pink stripes.

Example (Valid but not true)

All penguins have pink stripes.

All math teachers are penguins.

Therefore, all math teachers have pink stripes.

Example (May be true, but invalid)

All equilateral triangles have angles of 60° .

The triangle ABC has an angle of 60° .

Therefore, the triangle ABC is equilateral.

Syllogism 1

Fish live in water.

Monkeys are not fish.

Therefore, monkeys do not live in the water.

Syllogism 1

Fish live in water.

Monkeys are not fish.

Therefore, monkeys do not live in the water.

Syllogism 2

No Frenchmen like plum pudding

All Englishmen like plum pudding

Englishmen are not Frenchmen

Syllogism 1

Fish live in water.

Monkeys are not fish.

Therefore, monkeys do not live in the water.

Syllogism 2

No Frenchmen like plum pudding

All Englishmen like plum pudding

Englishmen are not Frenchmen

Syllogism 3

All lions are fierce

Some lions do not drink coffee

Some creatures that drink coffee are not fierce

Syllogism 1

Fish live in water.

Monkeys are not fish.

Therefore, monkeys do not live in the water.

Syllogism 2

No Frenchmen like plum pudding

All Englishmen like plum pudding

Englishmen are not Frenchmen

Syllogism 3

All lions are fierce

Some lions do not drink coffee

Some creatures that drink coffee are not fierce

Syllogism 4

No pigs can fly

All pigs are greedy

Some greedy creatures cannot fly

Syllogism 4

No pigs can fly

All pigs are greedy

Some greedy creatures cannot fly

Syllogism 5

Some pillows are soft

No pokers are soft

Some pokers are not pillows

Syllogism 4

No pigs can fly
All pigs are greedy
Some greedy creatures cannot fly

Syllogism 5

Some pillows are soft
No pokers are soft
Some pokers are not pillows

Syllogism 6

No emperors are dentists
All dentists are dreaded by children
No emperors are dreaded by children

Syllogism 4

No pigs can fly
All pigs are greedy
Some greedy creatures cannot fly

Syllogism 5

Some pillows are soft
No pokers are soft
Some pokers are not pillows

Syllogism 6

No emperors are dentists
All dentists are dreaded by children
No emperors are dreaded by children

Syllogism 7

Nothing intelligible ever puzzles me

Logic puzzles me

Logic is unintelligible

Syllogism 7

Nothing intelligible ever puzzles me

Logic puzzles me

Logic is unintelligible

Syllogism 8

If war is declared, the enemy country will be invaded

War is not declared

The enemy country will not be invaded

Syllogism 7

Nothing intelligible ever puzzles me

Logic puzzles me

Logic is unintelligible

Syllogism 8

If war is declared, the enemy country will be invaded

War is not declared

The enemy country will not be invaded

Syllogism 9

Ninety-nine Cretans in a hundred are liars

Epimenides is a Cretan

Epimenides is a liar

Syllogism 7

Nothing intelligible ever puzzles me

Logic puzzles me

Logic is unintelligible

Syllogism 8

If war is declared, the enemy country will be invaded

War is not declared

The enemy country will not be invaded

Syllogism 9

Ninety-nine Cretans in a hundred are liars

Epimenides is a Cretan

Epimenides is a liar

Syllogism 10

No bald creatures need a hairbrush

No lizards have hair

No lizards need a hairbrush

Syllogism 10

No bald creatures need a hairbrush

No lizards have hair

No lizards need a hairbrush