Abstract reasoning MCQ

for European institution competitions

A methodology and 180 questions with answers

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Published by ORSEU

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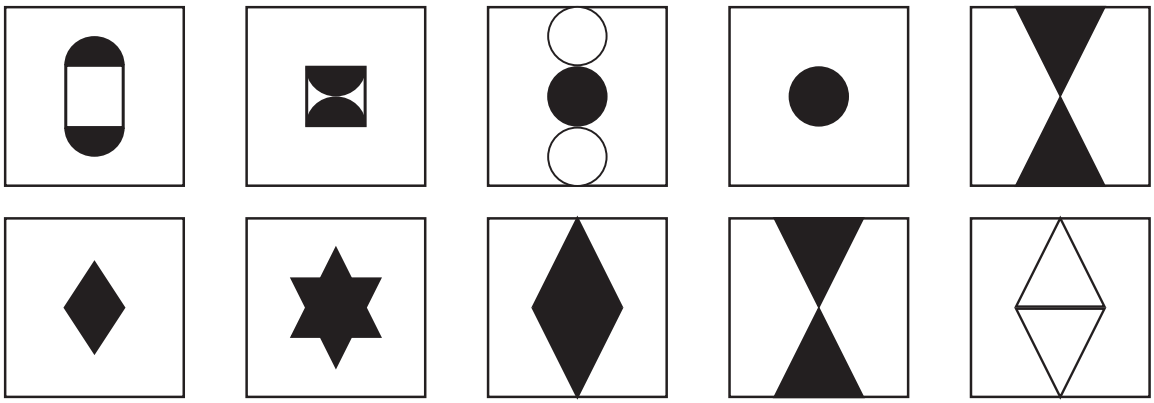
Q8. From the options available, select the next diagram in this series.

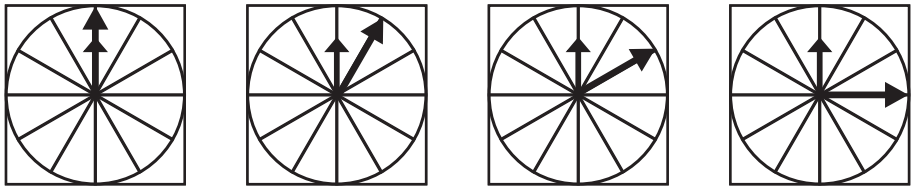


A B C D E

2. ROTATION

Rotation is a transformation in which an element is turned at a certain angle, around a point and in a given direction.

It is essential to master the notion of angles and direction of rotation in order to visualise this type of transformation correctly. The simplest way is to look at the way the hands of a clock move.



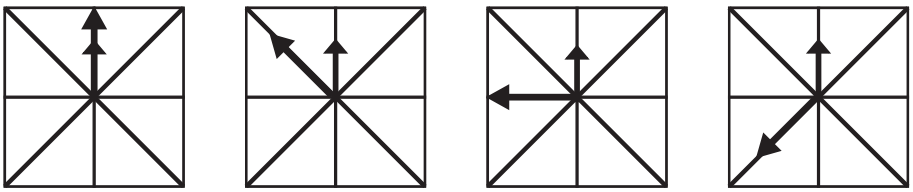
1 2 3 4

In diagram 1, the big hand is at 12 o'clock. In diagram 2, it is at 1 o'clock. The transformation that takes place between diagrams 1 and 2 is a 30° clockwise rotation around the centre. The 30° angle corresponds to the space between two consecutive hour lines, for example, between 12 o'clock and 1 o'clock[12].

In this series of diagrams, the big hand carries out a succession of 30° clockwise rotations. Compared with diagram 1, the big hand in diagram 4 has therefore carried out a 90° clockwise rotation around the centre (3 x 30° = 90°).

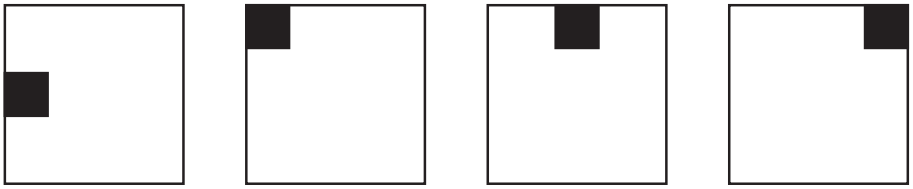
[12] A complete turn would be 360°. The angle between the two consecutive hour lines is therefore equivalent to: 360°/12 = 30°.

In addition to the angle, it is also necessary to visualise the direction of rotation. There are two directions: clockwise (rotation in the direction the hands of a clock move) and anti-clockwise (rotation in the opposite direction to the hands of a clock).

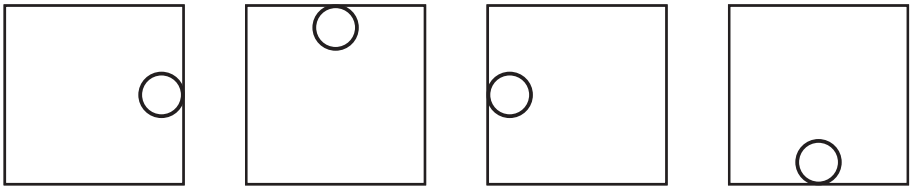


In this series, the big hand carries out a succession of 45° anti-clockwise rotations. The 45° angle corresponds to the space between two consecutive hour lines[13].

Rotations are transformations frequently used in abstract reasoning questions. Here are two series of diagrams to help familiarise you with this type of transformation.



The black square is rotated 45° clockwise around the centre of the diagram.

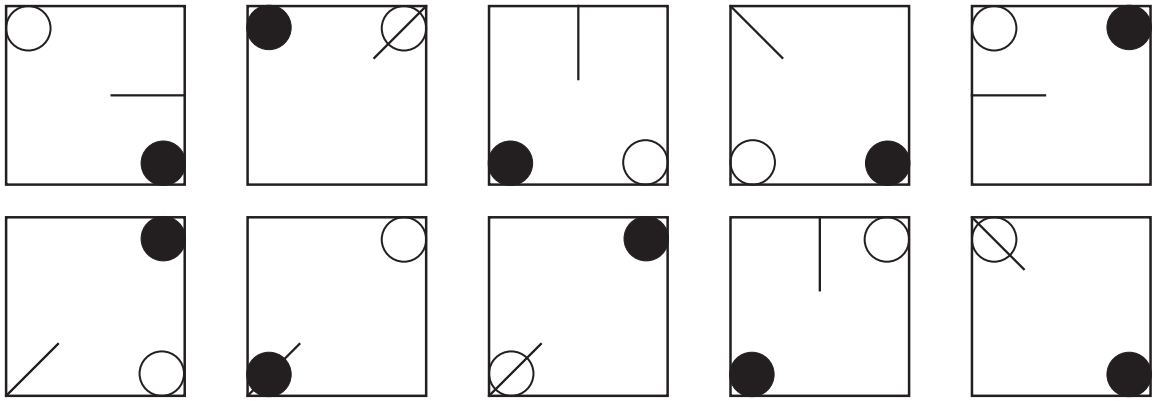


The white circle is rotated 90° anti-clockwise around the centre of the diagram.

[13] 360°/8 = 45°

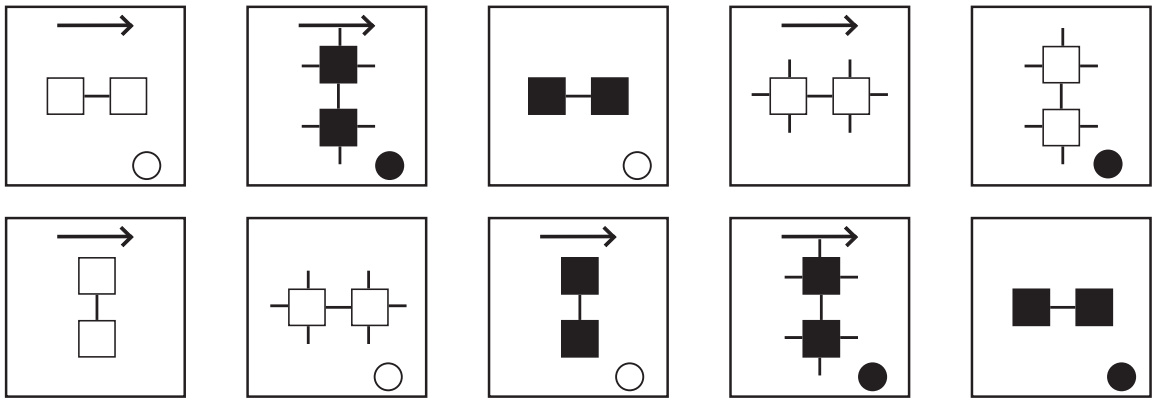
Each question consists of a series of diagrams that follow a logical sequence or that contain a set of underlying rules. From the five options available, select the diagram that completes the series.

Question 131



A B C D E

Question 132



A B C D E

77 ►A

We need to consider two types of element:

- the shapes in the lines at the top and bottom;
- the arrows in the lines in the middle which represent instructions: the arrows at the top act on the shapes at the top; the arrows at the bottom act on the shapes at the bottom.

The instructions are as follows:

- black arrow: colour inversion of the shape;
- white arrow: no colour change;
- all the shapes move one box to the right; when a shape is in the last box, it moves to the first box;
- the colour changes take place before the shapes move.

78 ►D

We need to consider the number of elements and their colour.

The logical sequence applied to each diagram is as follows: each diagram contains 1 black element and 3 white elements.

79 ►B

We need to consider all the elements.

The logical sequence applied to each diagram is as follows:

- 90° anti-clockwise rotation of the black square around the centre of the diagram;
- 45° anti-clockwise rotation of the triangle on itself around the centre of the diagram, and colour inversion;
- 90° anti-clockwise rotation of the circle in the centre of the diagram and inversion of size and colour:
- when a black element and a white element occupy the same position, the black element is on top of the white element (in diagram 4, the black square masks the white triangle).

80 ►D

We need to consider the number of lines.

The logical sequence applied to each diagram is as follows: the number of lines increases by 1.