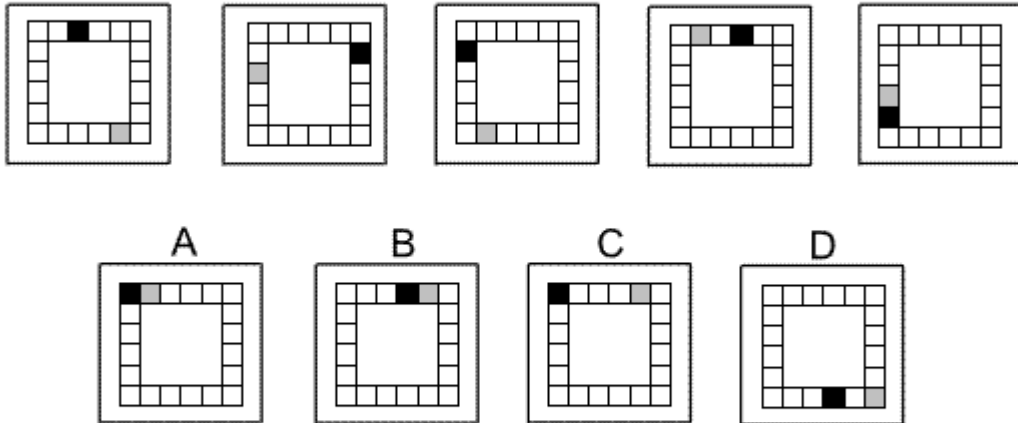


## Inductive Reasoning Practice Test 2

Solution Booklet

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**Question 1**



Solution: C

Explanation:

In this question there is a black square and a grey square that move around the perimeter of the grid each according to its own rule.

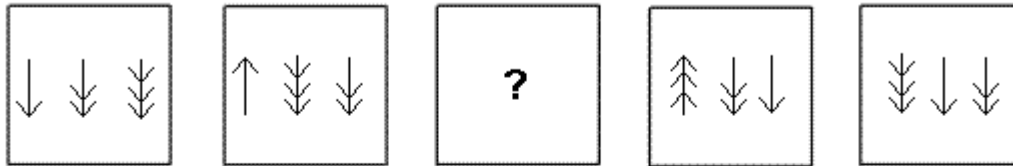
The black square moves alternately 4 places clockwise and 7 places anticlockwise.

The grey square moves alternately 7 places clockwise and 4 places anticlockwise.

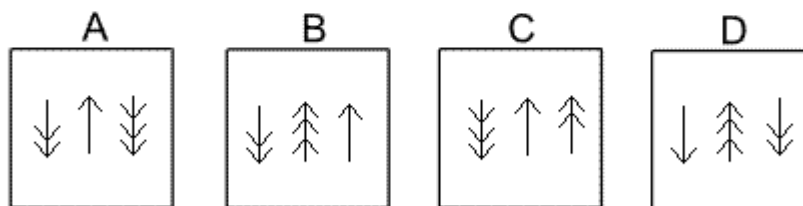
To find the next diagram in the sequence, therefore, the black square must move 4 places clockwise and the grey square must move 7 places clockwise. The correct answer, therefore, is C.

---

**Question 2**



**Which of the following replaces the question mark in the sequence?**



Solution: B

Explanation:

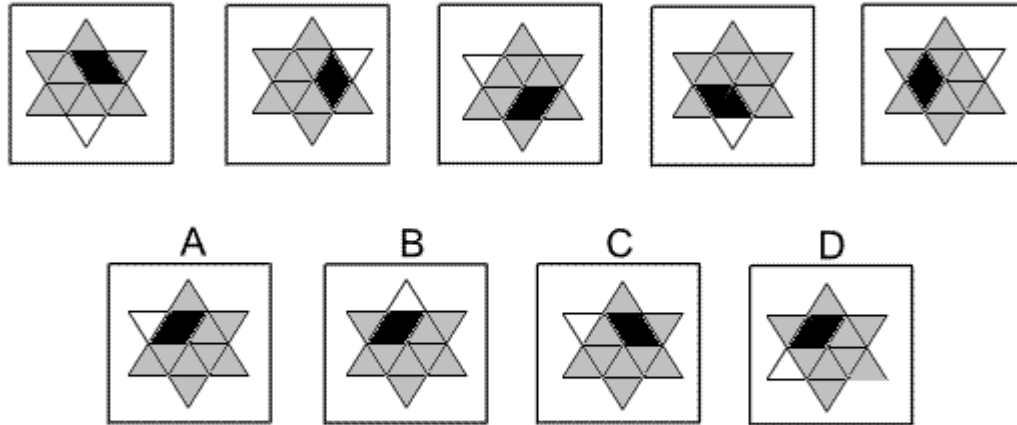
In this question there are two rules to follow.

The first rule is that the arrowheads on one of the arrows change direction, starting with the arrow on the left, then the arrow in the middle, then the arrow on the right, then back to the arrow on the left etc. Following this rule, for the diagram with the ?, the arrow in the middle (with three arrowheads) should change direction. The correct answer, therefore, could be B or D.

The second rule is that the other two arrows change places. For the diagram with the ?, therefore, the arrow on the left (with one arrowhead) and the arrow on the right (with two arrowheads) should change places. The correct answer, therefore, is B.

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**Question 3**



Solution: A

Explanation:

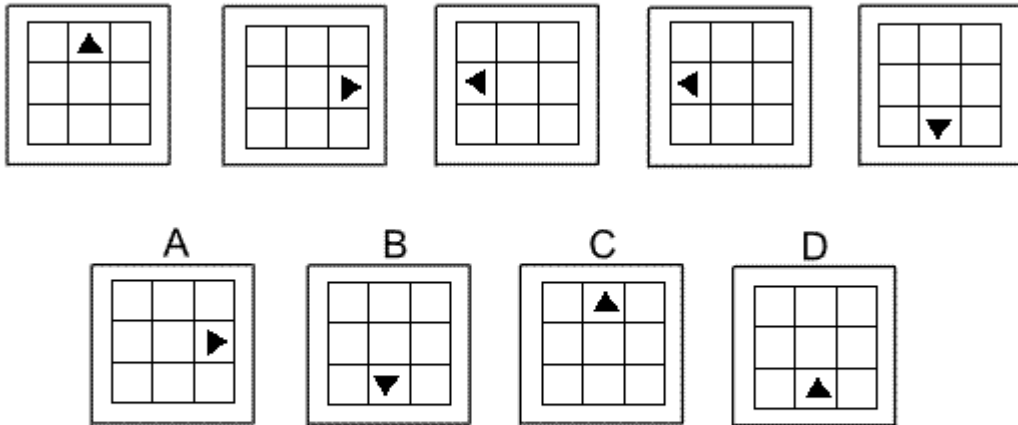
In this question there is a grid of equilateral triangles in the shape of a star, mostly coloured grey, but with two adjacent black triangles (making a diamond shape) and one white triangle. The diamond shape and the white triangle each moves according to its own rule.

The black diamond moves around the inner hexagon of the star, rotating each time by  $60^\circ$  clockwise. Following this rule, for the next diagram of the sequence, the diamond should rotate to the two triangles in the top left corner of the hexagon. The correct answer, therefore, could be A, B or D.

The white triangle moves around the outer perimeter of the star, rotating by  $120^\circ$  anticlockwise each time. Following this rule, for the next diagram in the sequence, the white triangle should rotate to the top left point of the star. The correct answer, therefore, is A.

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**Question 4**



Solution: B

Explanation:

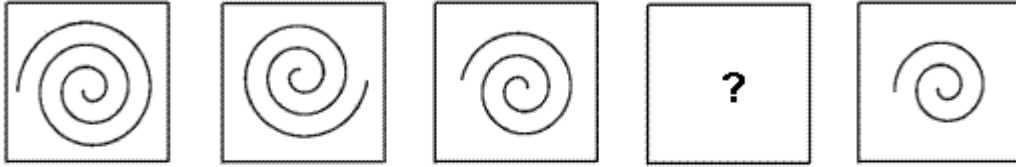
In this question the black triangle is reflected successively in three axes of symmetry:

1. The diagonal stretching from the bottom left corner of the grid to the top right corner.
2. The vertical line through the centre of the grid.
3. The horizontal line through the centre of the grid.

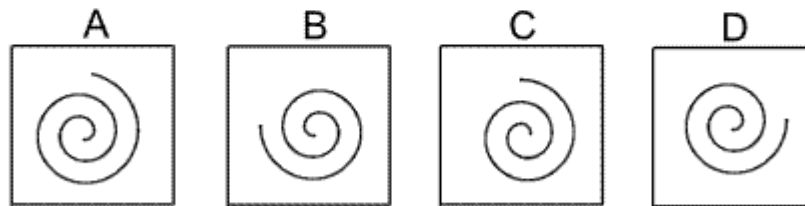
Following these rules, to obtain the next diagram in the sequence, the next reflection should be type 2. The correct answer, therefore, is B.

---

**Question 5**



**Which of the following replaces the question mark in the sequence?**



Solution: D

Explanation:

In this question, there are two rules to follow.

The first rule is that a  $90^\circ$  arc is erased every time from the outer extremity of the spiral. Following this rule, the correct answer could be B, C or D.

The second rule is that the remaining part of the spiral is rotated by  $90^\circ$  clockwise each time. Following this rule, the correct answer must be D.

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Question 6



Solution: A

Explanation:

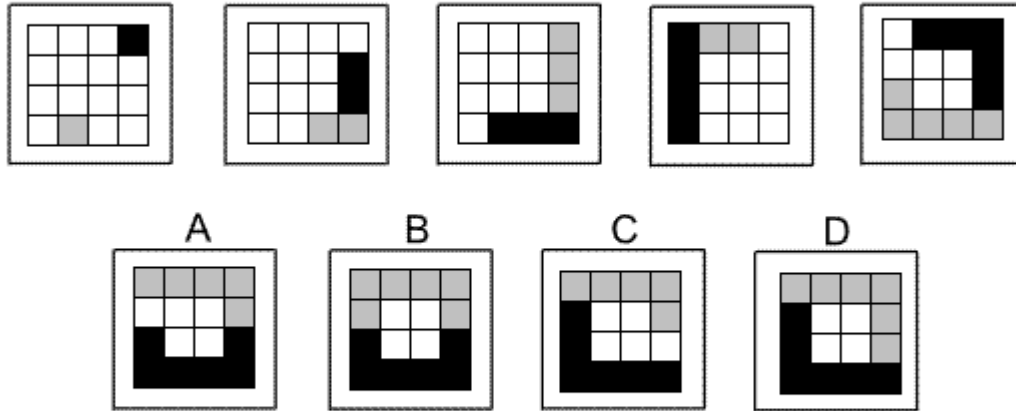
In this question the dot rotates around the inside of the pentagon. The direction of the arrow from its previous position indicates whether the rotation is clockwise or anticlockwise. The number of arrowheads on the arrow of its previous position indicates the number of fifths of a complete turn by which it should rotate.

For the next diagram in the sequence, therefore, it should rotate two fifths of a complete turn in a clockwise sense.

The correct answer, therefore, is A.

---

**Question 7**



Solution: D

Explanation:

In this question the black squares move around the perimeter of the grid in a clockwise sense and the grey squares move around the perimeter of the grid in an anticlockwise sense.

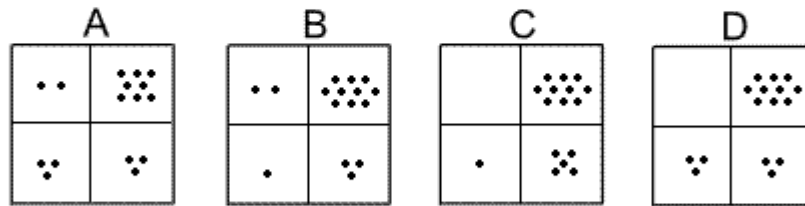
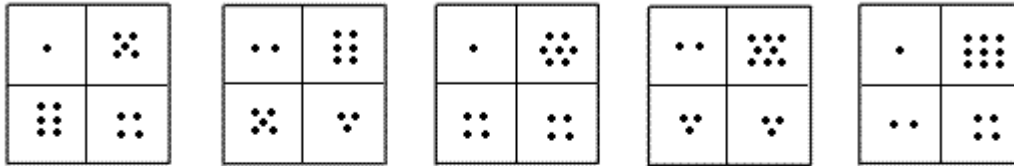
From one diagram to the next, the number of black squares increases by one each time and the number of grey squares also increases by one each time. At the same time, the longer train of squares occupies the next available squares around the perimeter of the grid as they move around (black, clockwise and grey anticlockwise). Where black and grey squares overlap, only the black is visible.

Following these rules, the next diagram of the sequence must be D



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**Question 8**



Solution: B

Explanation:

In this question there are two rules to follow that are applied successively.

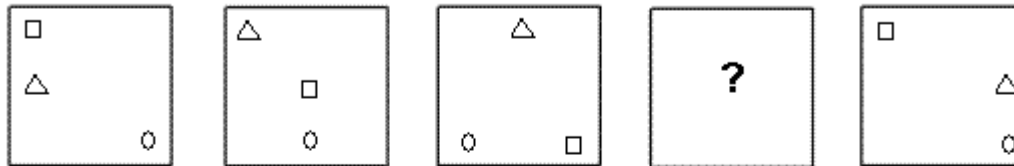
The first rule is that the numbers of dots in the top row increase by one while the numbers of dots in the second row decrease by one.

The second rule is that the numbers of dots in the first column decrease by one while the numbers of dots in the second column increase by one.

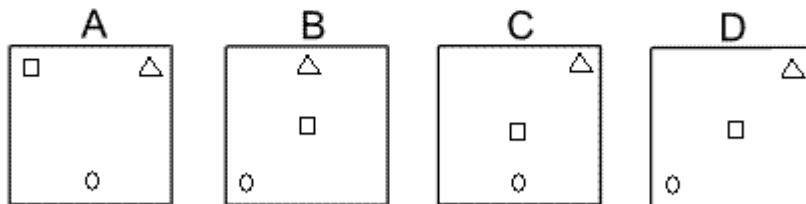
The next rule to follow, therefore, is the first rule. The correct answer, therefore, is B.

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**Question 9**



**Which of the following replaces the question mark in the sequence?**



Solution: C

Explanation:

In this question, each of the three shapes has its own rule to follow.

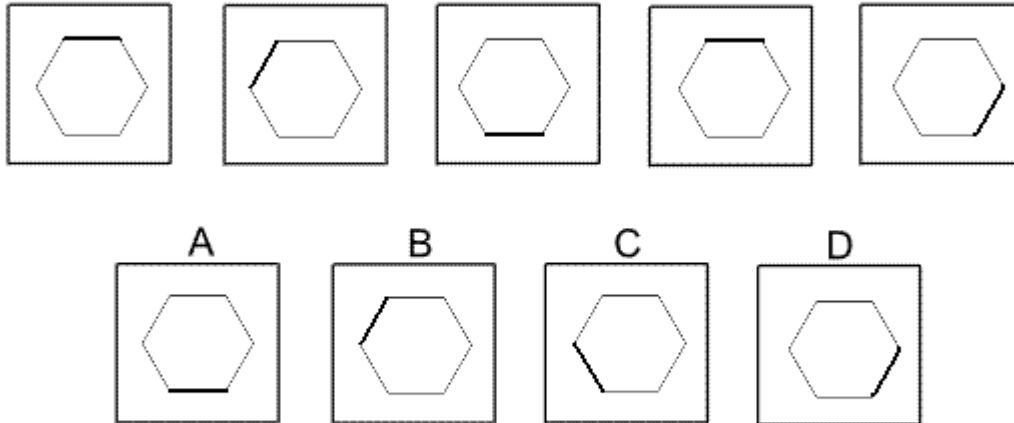
The triangle rotates clockwise around the perimeter of the square occupying eight positions, moving one place each time. Following this rule, for the missing diagram of the sequence, the triangle should be in the top right corner of the square. The correct answer, therefore, could be A, C or D.

The small square occupies the three positions on the main diagonal of the large square that stretches from the top left corner to the bottom right corner. It also moves one place each time and keeps going backwards and forwards along the diagonal. Following, this rule, for the missing diagram of the sequence, the small square should be in the centre of the large square. The correct answer, therefore, could be C or D.

The circle moves along the bottom edge of the square, occupying three positions one place at a time, and keeps going backwards and forwards along the bottom edge. Following this rule, for the missing diagram of the sequence, the circle should be in the centre of the bottom edge. The correct answer, therefore, is C.

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**Question 10**



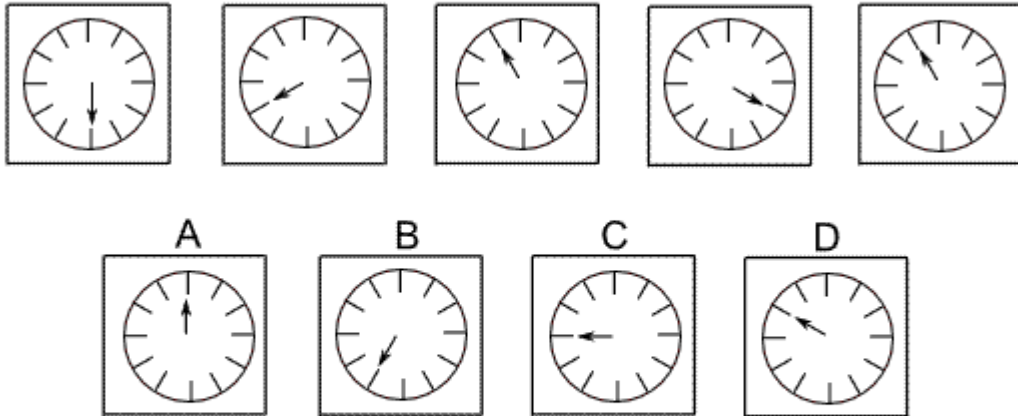
**Solution:** A

**Explanation:**

In this question there is a regular hexagon with one edge shaded darker than the others. The rule is that the hexagon rotates anticlockwise about its centre point by multiples of  $60^\circ$  - the first time by  $60^\circ$ , the second by  $2 \times 60^\circ = 120^\circ$ , the third by  $3 \times 60^\circ = 180^\circ$  etc. Following this rule, to obtain the next diagram in the sequence, the hexagon should rotate by  $5 \times 60^\circ = 300^\circ$  anticlockwise. The correct answer, therefore, is A.

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**Question 11**



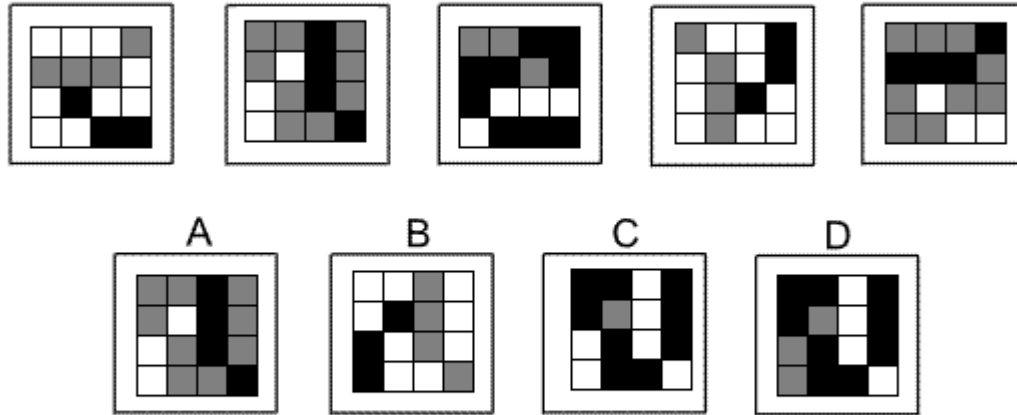
Solution: D

Explanation:

In this question, the hand rotates clockwise around the clock face. The numbers of places it rotates successively are the numbers of the sequence of prime numbers - 2, 3, 5, 7 etc. The next prime number in the sequence is 11, so the next diagram in the sequence must be D (where the hand of the clock has progressed by 11 places clockwise).

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Question 12



Solution: D

Explanation:

In this question there are two rules to follow that must be applied at the same time.

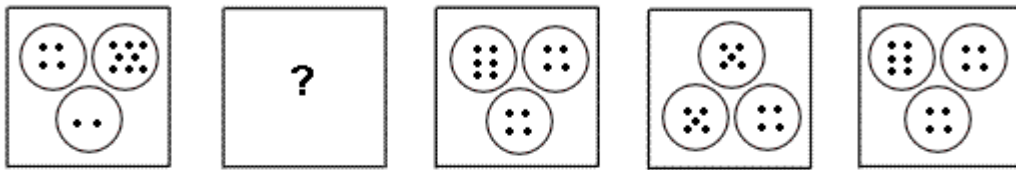
The first rule is that the grid should be rotated by 90° clockwise each time.

The second rule is that the colours of the squares change according to the rule - black changes to white, white changes to grey and grey changes to black.

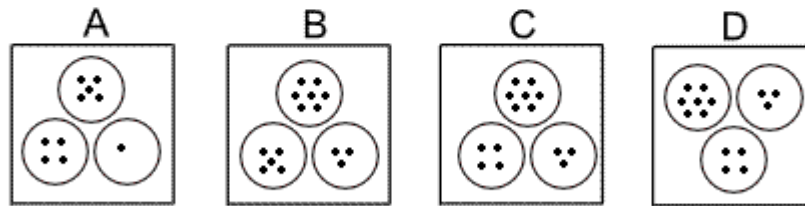
When these two rules are applied at the same time, then the next diagram in the sequence must be D.

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Question 13



Which of the following replaces the question mark in the sequence?



Solution: C

Explanation:

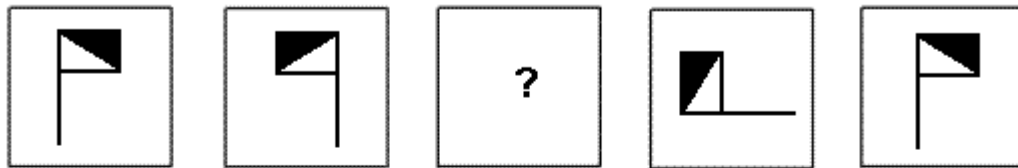
In this question there are two rules to follow.

The first rule concerns the circles which rotate by  $60^\circ$  anticlockwise each time. Following this rule, the missing diagram of the sequence could be A, B or C.

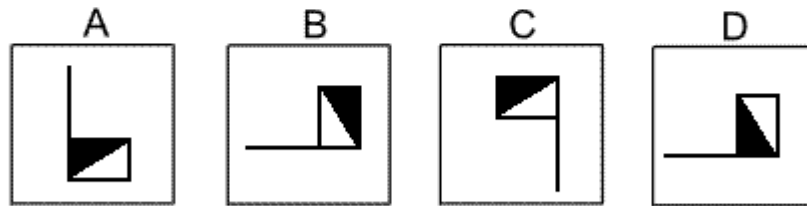
The second rule concerns the number of dots. The circle with four dots always has four dots. The circle that starts with two dots increases by one dot each time. The circle that starts with eight dots decreases by one each time. Following this rule, the missing diagram of the sequence must be C.

---

Question 14



Which of the following replaces the question mark in the sequence?



Solution: B

Explanation:

In this question there are two rules to follow that are applied one after the other.

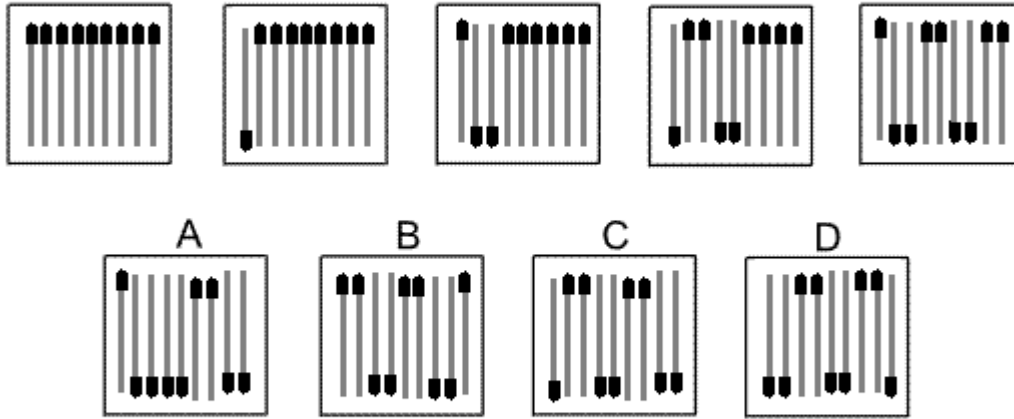
The first rule is that the flag is reflected in the vertical axis.

The second rule is that the flag is rotated by 90° clockwise.

To find the missing diagram of the sequence, the second rule should be applied. The correct answer, therefore, is B.

---

Question 15



Solution: C

Explanation:

In this question there are nine matchsticks.

Firstly the first match on the left only is inverted.

Next the first three matches on the left are inverted.

Then the first five matches on the left are inverted.

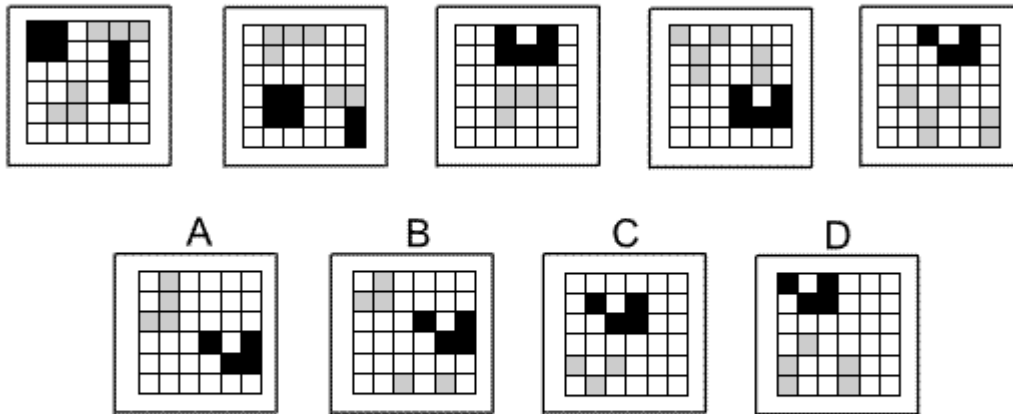
Then the first seven matches on the left are inverted.

To obtain the next diagram in the sequence, therefore, all nine matches must be inverted. The correct answer is C.



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Question 16



Solution: A

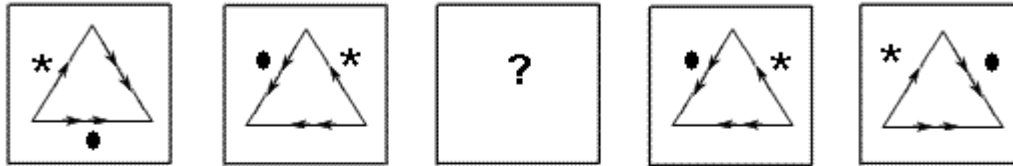
Explanation:

In this question there is a grid of squares.

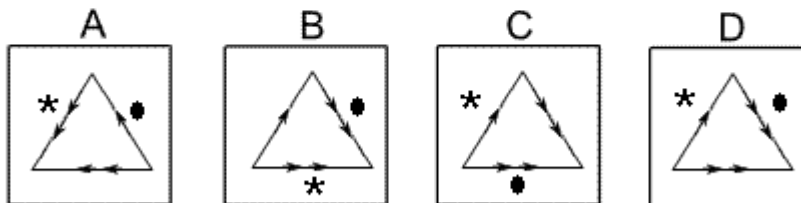
There is a single rule to follow - each time the squares of the grid are translated 1 square to the right and three squares down. Following this rule, the next diagram of the sequence must be A.

---

Question 17



Which of the following replaces the question mark in the sequence?



Solution: D

Explanation:

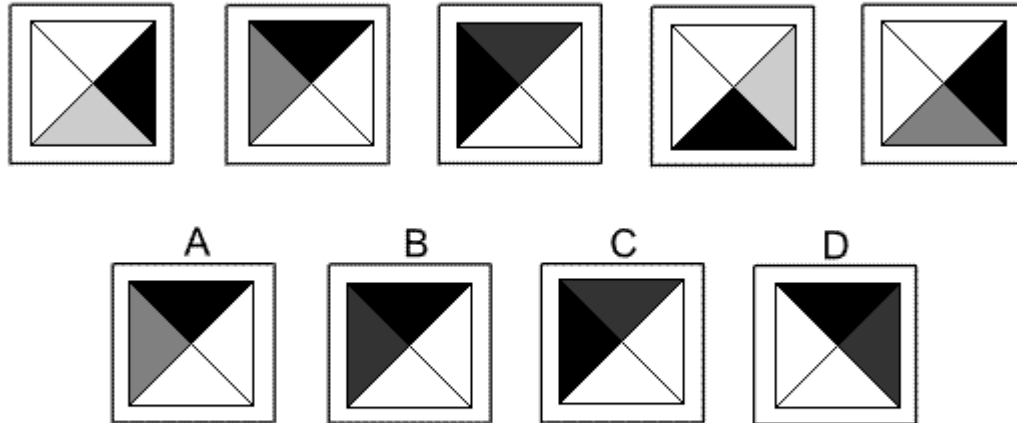
In this question there are two rules to follow.

The first rule is that the equilateral triangle and its arrows are reflected in the vertical axis from each diagram to the next. Following this rule, the missing diagram of the sequence could be B, C or D.

The second rule is that the asterisk and the dot move around the outside of the triangle by a number of places equal to, and direction given by, the arrowheads from the previous diagram. Following this rule, the dot will move to the right edge of the triangle and the asterisk will move to the left edge – the missing diagram of the sequence, therefore, is D.

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**Question 18**



**Solution: B**

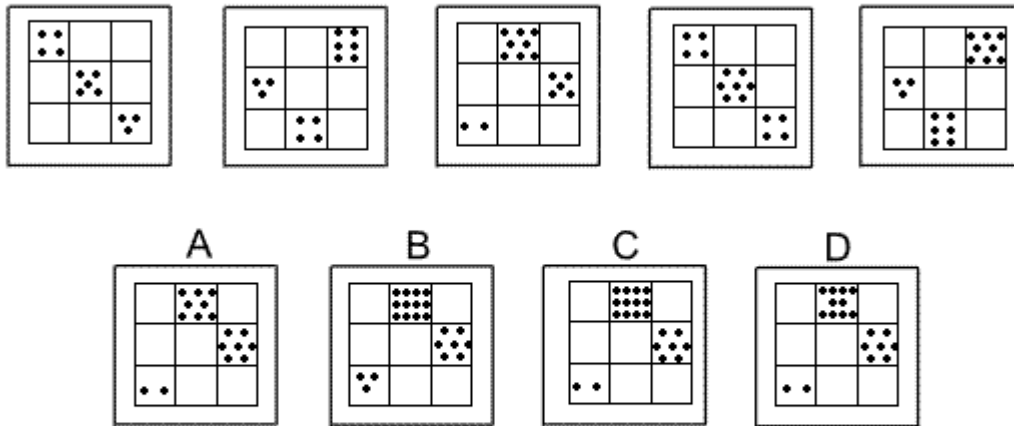
**Explanation:**

In this question, there is a black triangle and a grey triangle which each has its own rule. The black triangle always rotates by 90° anticlockwise. Following this rule, for the next diagram in the sequence, the black triangle should be in the top quadrant of the diagram. The correct answer, therefore, could be A, B or D.

The grey triangle also rotates, but by 90° clockwise each time. However, the shade of the grey triangle also changes from light grey to medium grey to dark grey, back to light grey again. Following this rule, for the next diagram of the sequence, the grey triangle should be in the left quadrant of the diagram and should be dark grey. The correct answer, therefore, is B.

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Question 19



Solution: C

Explanation:

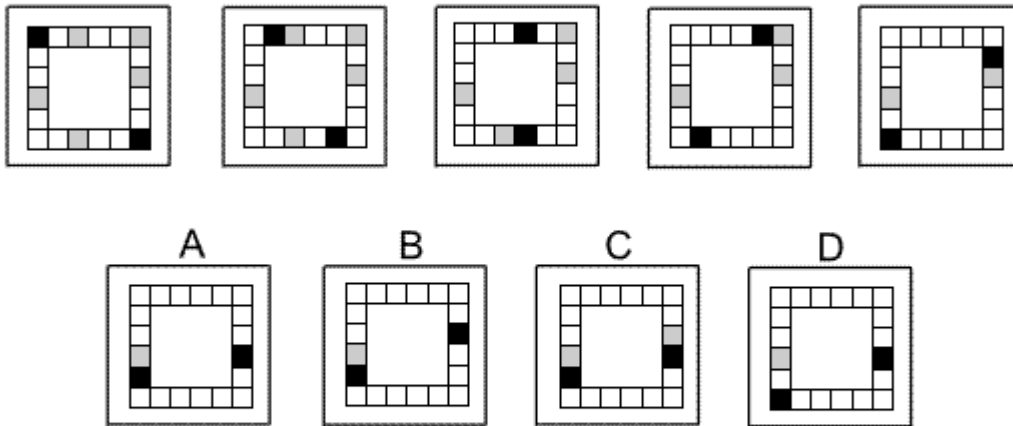
In this question there are two rules that apply to squares with dots as they move down the columns of the grid.

First rule: The squares in the first and second rows of the grid move down one place and the number of dots decreases by one. Following this rule, for the next diagram of the sequence, there should be two dots in the first column, third row and seven dots in the third column, second row. The correct answer, therefore, could be A, C or D.

Second rule: The squares in the bottom row of the grid move to the top row and the numbers of dots are doubled. Following this rule, for the next diagram in the sequence, there should be twelve dots in the first row, second column. The correct answer, therefore, is C.

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**Question 20**



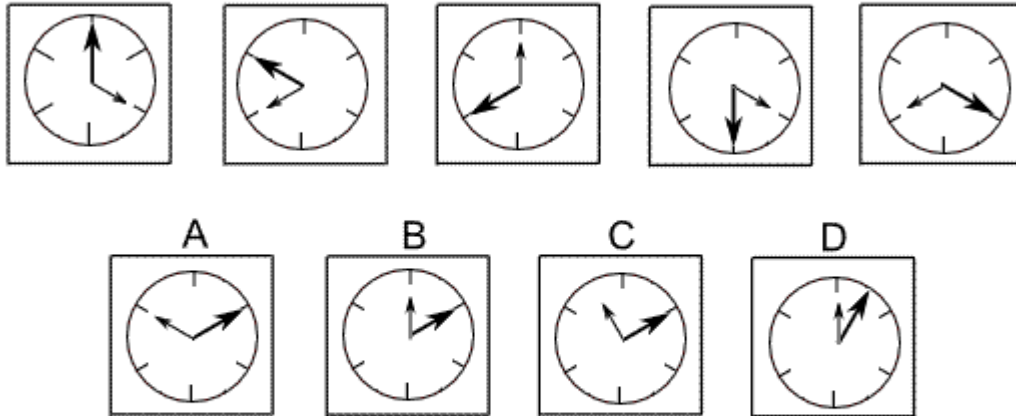
Solution: A

Explanation:

In this question the black squares move clockwise around the perimeter of the grid. They move one place only, except when they catch up with a grey square, in which case in the next move the black square jumps over and 'takes' the grey square - just like in draughts - and the grey square is removed from the grid. Following this rule, for the next diagram in the sequence, the black square on the left will move one place, but the black square on the right will 'take' the grey square below it and move down two places. The correct answer, therefore, is A.

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**Question 21**



Solution: B

Explanation:

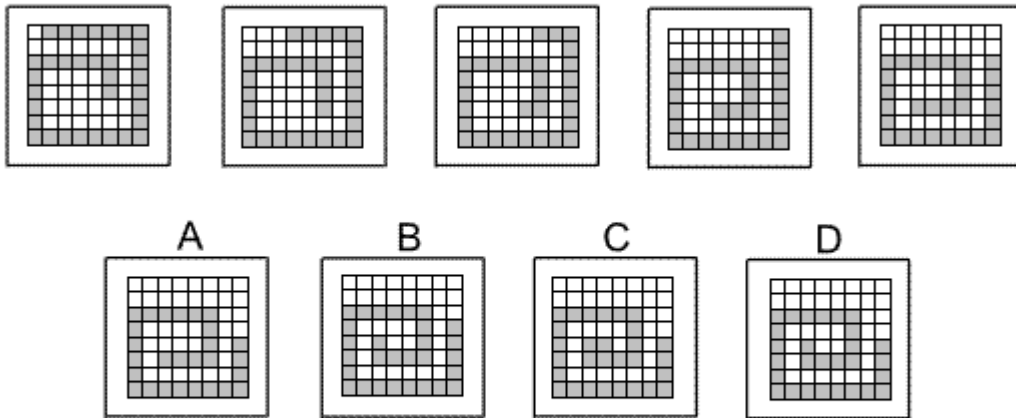
In this question there is a dial with a big hand and a small hand.

The big hand rotates about the centre of the dial by  $60^\circ$  anticlockwise each time. Following this rule, for the next diagram in the sequence, the big hand should point towards two o'clock. The correct answer, therefore, could be A, B or C.

The small hand rotates about the centre of the dial by  $120^\circ$  clockwise each time. Following this rule, for the next diagram in the sequence, the small hand should point towards 12 o'clock. The correct answer, therefore, is B.

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**Question 22**



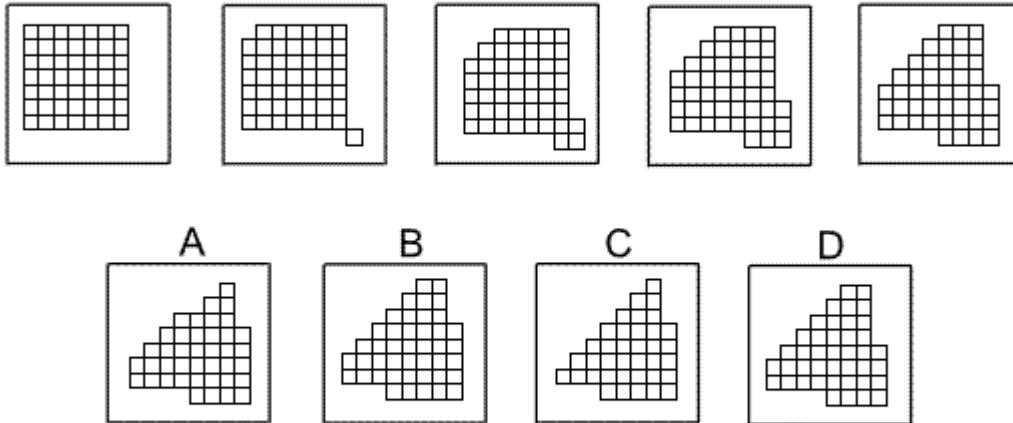
Solution: D

Explanation:

In this question there is a 'snake' of grey squares that moves spiral-fashion in a clockwise sense towards the centre of the grid. As it moves, it gains one square at the 'head' of the 'snake' and loses two squares at the 'tail' of the 'snake' each time. The correct answer, therefore, is D.

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**Question 23**



Solution: B

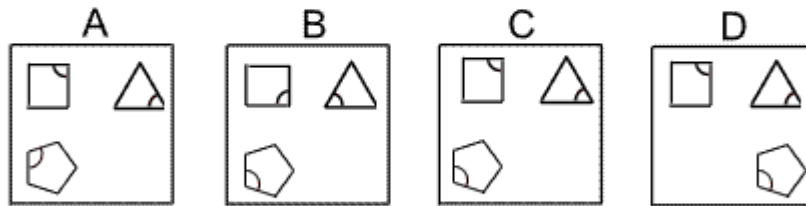
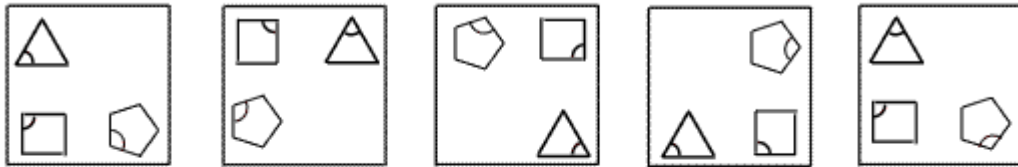
Explanation:

In this question we start off with a 7 by 7 square grid. One square is removed from the top left corner of the grid and added to the bottom right corner of the grid to start an 'L-shape'. From then onwards, at each stage of the sequence, a diagonal of squares is removed from the top left hand corner of the grid and two squares are joined to the bottom right hand corner to increase the size of the 'L-shape'. Following this rule, for the next diagram of the sequence, a diagonal of five squares should be removed from the top left corner of the grid and two squares added to the bottom right corner to make a 5 by 5 'L-shape'. The correct answer, therefore, is B.



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Question 24



Solution: C

Explanation:

In this question everything rotates clockwise.

The equilateral triangle rotates about its own centre by  $120^\circ$  each time.

The square rotates about its own centre by  $90^\circ$  each time.

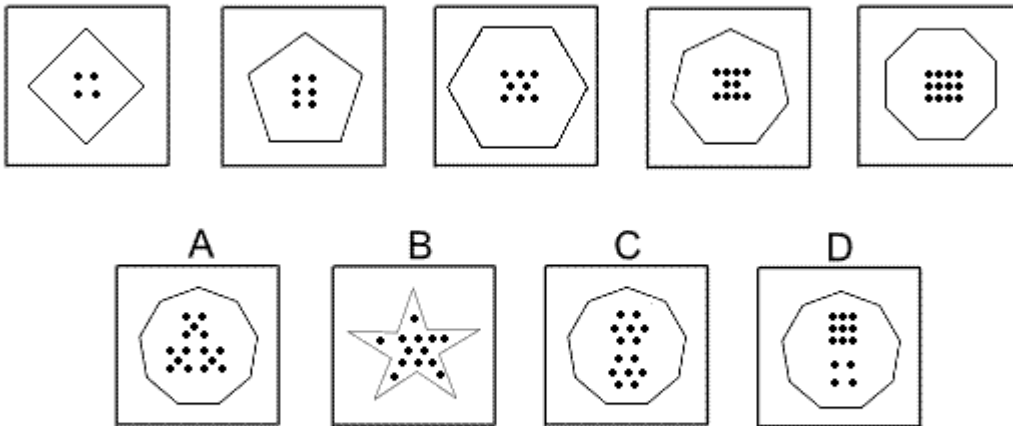
The regular pentagon rotates about its own centre by  $108^\circ$  each time.

Simultaneously the three shapes rotate by  $90^\circ$  each time about the centre of the large square.

Following these rules, the next diagram of the sequence must be C.

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**Question 25**



**Solution: C**

**Explanation:**

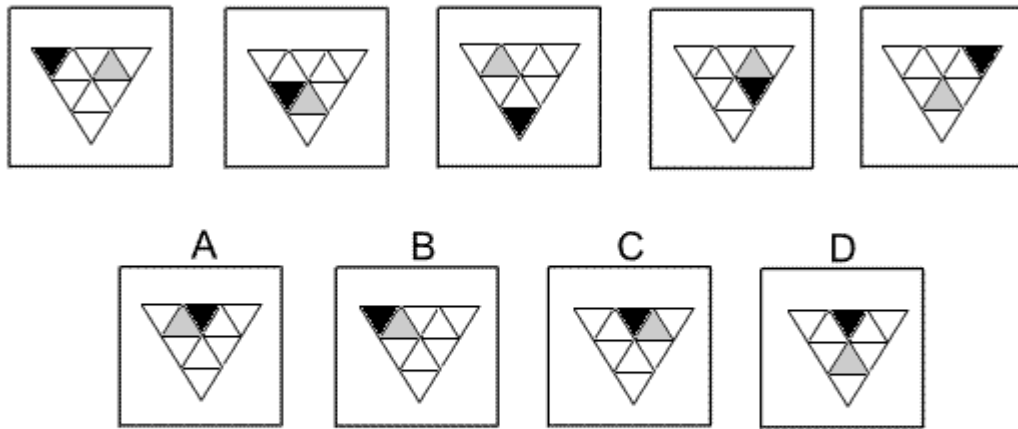
In this question there are two rules to follow.

The first rule is that the shapes are regular polygons, with the number of sides increasing by 1 each time. Following this rule, for the next diagram in the sequence, there should be a regular nonagon (nine-sided polygon). The correct answer, therefore, could be A, C or D.

The other rule is that the number of dots inside the polygons increases by two each time. For the next diagram in the sequence, therefore, there should be 14 dots. The correct answer, therefore, is C.

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**Question 26**



Solution: A

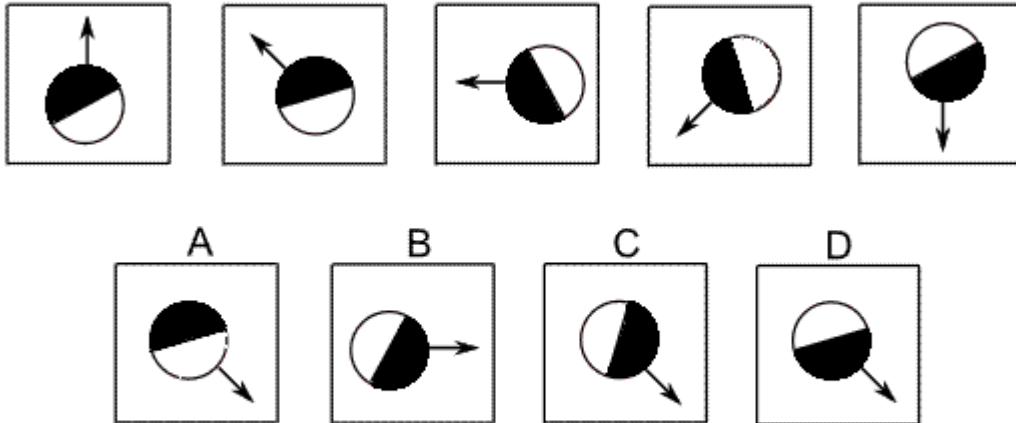
Explanation:

In this question there is a big equilateral triangle divided up into a grid of nine equilateral triangles, one of which is shaded black and one shaded grey. The black and grey triangle each moves according to its own rule.

The black triangle moves one place anticlockwise around the six small triangles that share an edge with the big triangle. Following this rule, in the next diagram of the sequence, the triangle in the centre at the top should be shaded black. The correct answer, therefore, could be A, C or D. The grey triangle moves one place clockwise around the three small triangles that do not share an edge with the big triangle. Following this rule, the grey triangle will move to the top left of the three. The correct answer, therefore, is A.

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Question 27



Solution: D

Explanation:

In this question there are two rules that are performed simultaneously.

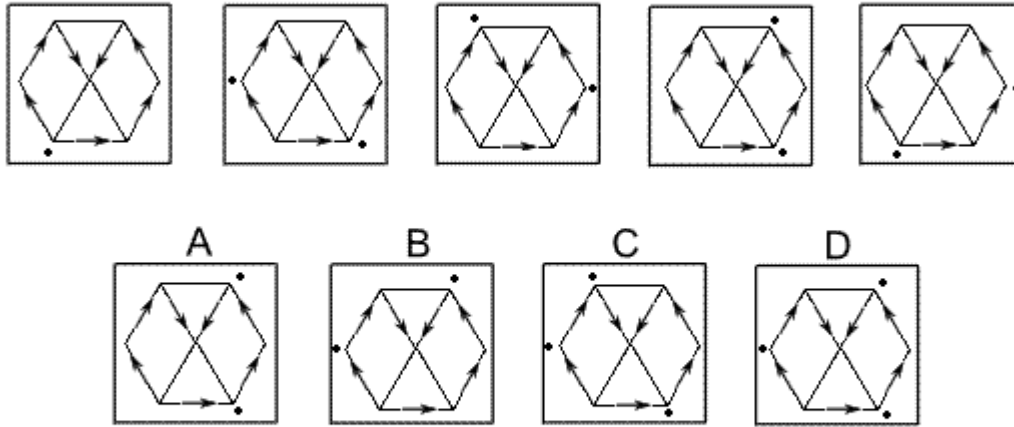
The first rule is that the shape is reflected in the axis that follows the direction of the arrow.

The second rule is that the shape is rotated by  $45^\circ$  anticlockwise each time.

Following the second rule, the answer could be A, C or D. But the first rule tells us that the correct answer must be D. In A, the wrong half of the circle is coloured black. In C, the shape has not been reflected.

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**Question 28**



Solution: D

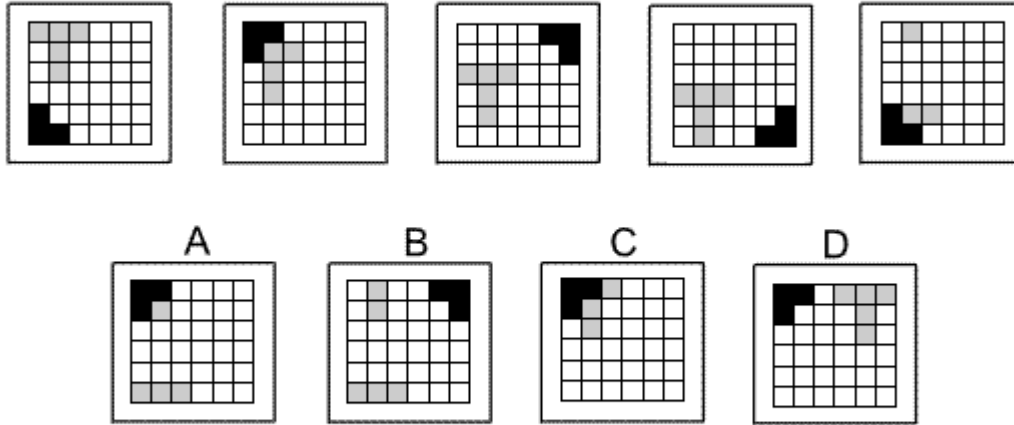
Explanation:

In this question there is a network of arrows around five edges and two diagonals of a hexagon. The dot moves in the direction of the arrow to the next vertex of the hexagon. However, if there are two possible routes, the dot multiplies to two dots with one dot following each of the possible routes.

Following this rule, the dot in the bottom left of the hexagon in the fifth diagram will multiply so that, in the next diagram of the sequence, there will be three dots altogether. The correct answer, therefore, is D.

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**Question 29**



Solution: A

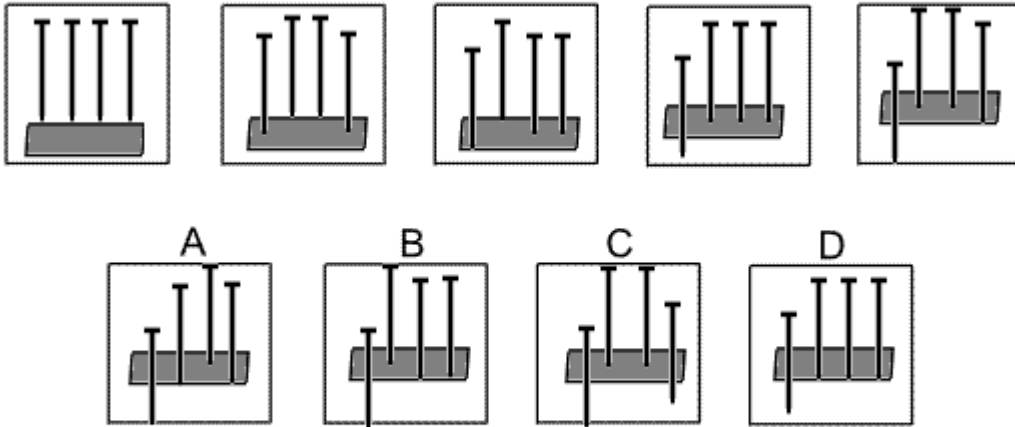
Explanation:

In this question there is a grid of squares with a black L-shape and a grey coloured T-shape. The L-shape rotates around the corners of the grid by 90° clockwise each time. Following this rule, the correct answer could be A, C or D.

The T-shape moves down one place each time. When the T-shape (or part of the T-shape) reaches the bottom row, it moves in the next diagram of the sequence to the top row. However, sometimes parts of the grey T-shape are obscured by the black L-shape. Following this rule, the correct answer must be A.

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**Question 30**



Solution: B

Explanation:

In this question there is a block of wood and four nails.

Each time the first nail (on the left) and one other nail are hit with a hammer - the first time, the first and fourth nails are hit, the second time the first and third nails are hit, the next time the first and second, then back to the first and fourth etc.

For the next diagram of the sequence, therefore, the first and third nails should be hit. The correct answer, therefore, is B.

- End of Test 2 -