4.3 Matrices: Test Pack

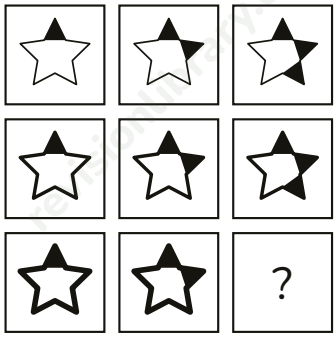
GL ASSESSMENT EP.N3 · Calculators not allowed · about 60 minutes

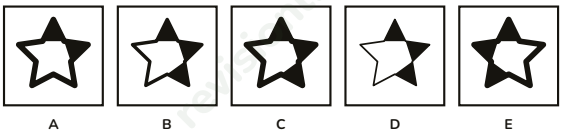
Total Marks

Name: _____ Date: ____ / ____ / _____

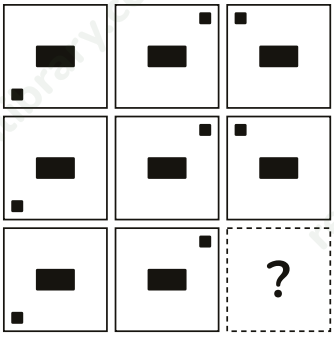
Answer ALL questions. Show all your working.

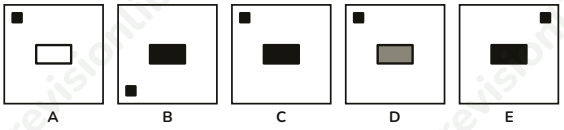
1 Study the 3x3 matrix of figures below. One rule links the figures across each row; a second rule links the figures down each column. The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.



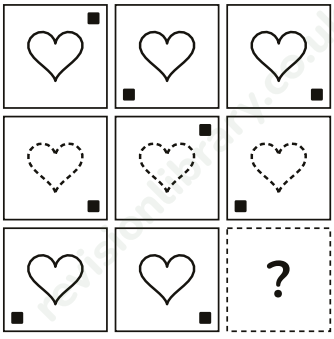


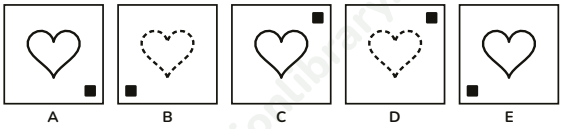
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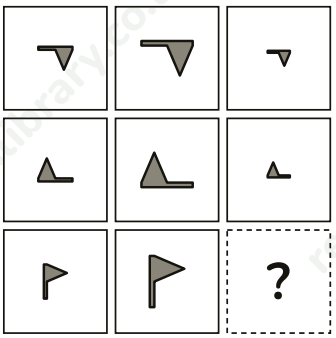
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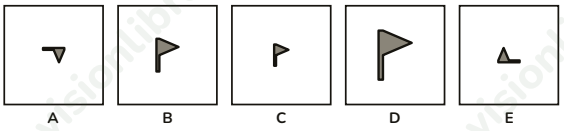




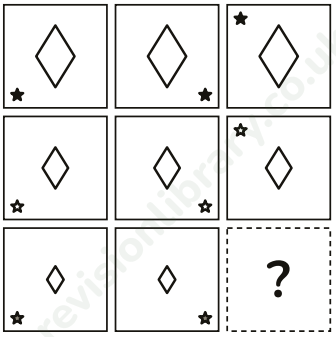
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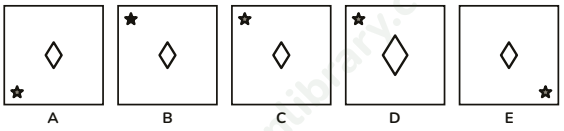
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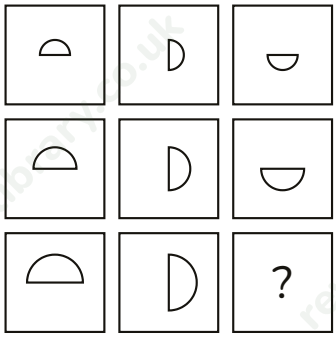


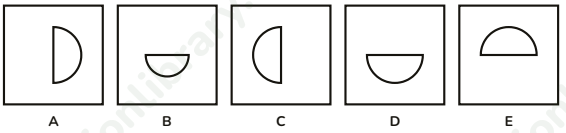
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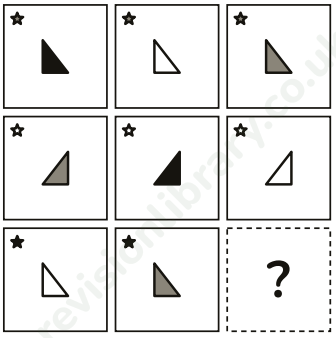


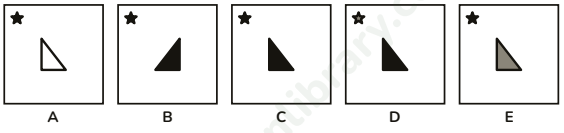
6 Study the 3x3 matrix of figures below. One rule links the figures across each row; a second rule links the figures down each column. The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.





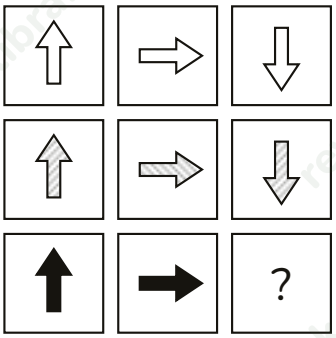
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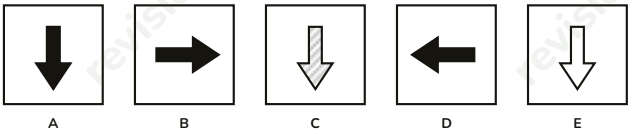




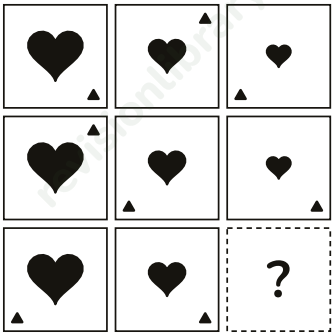
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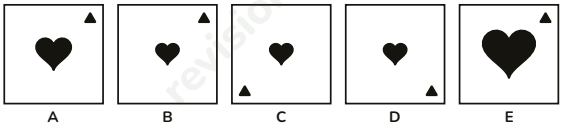
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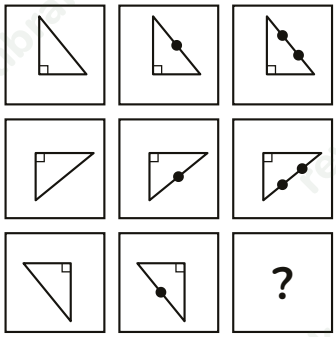


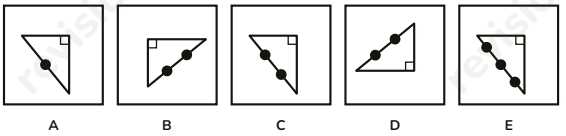
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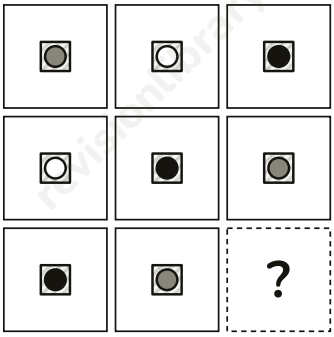


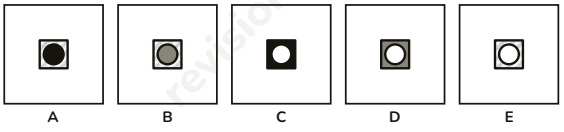
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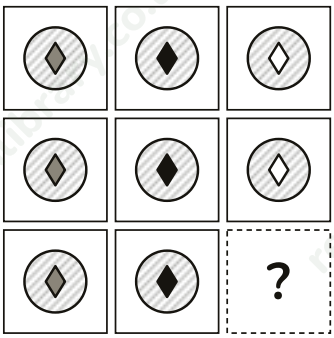
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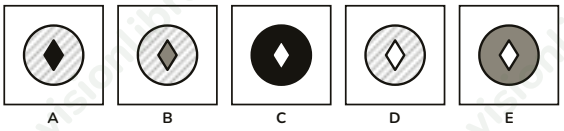




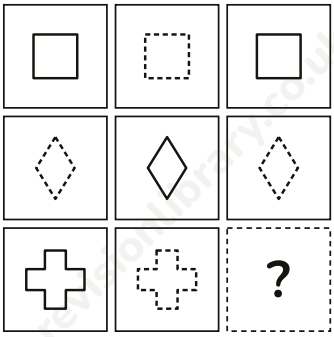
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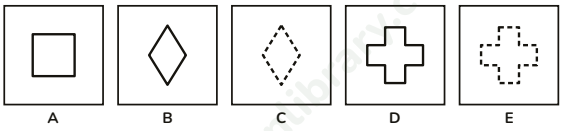
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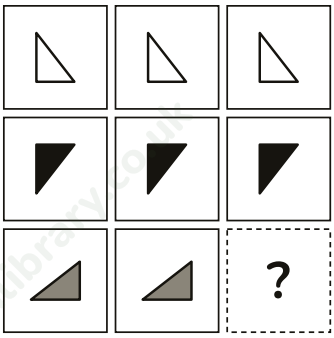


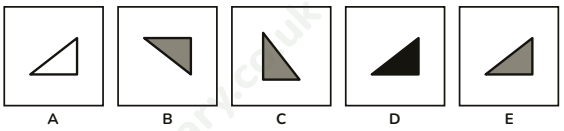
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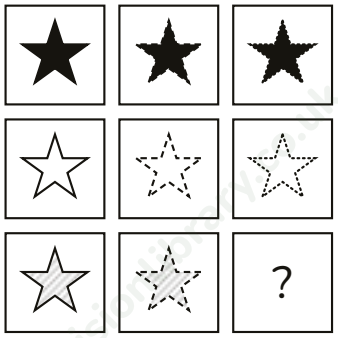


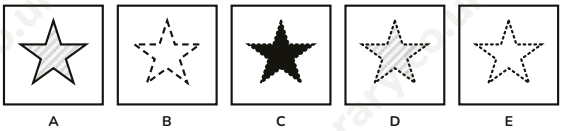
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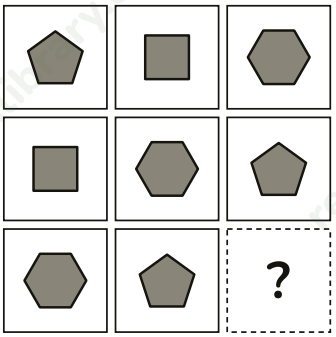
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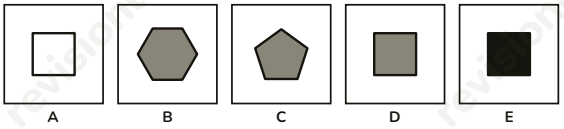




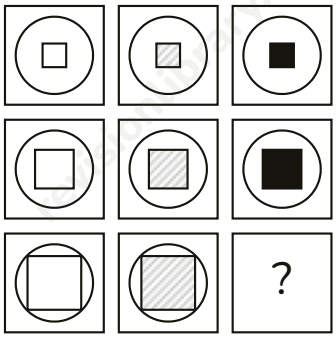
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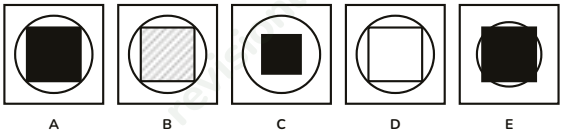
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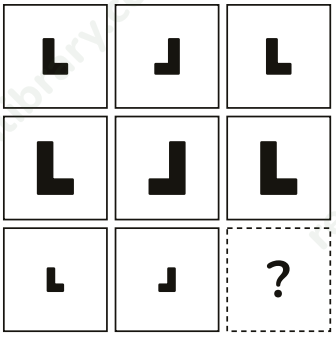


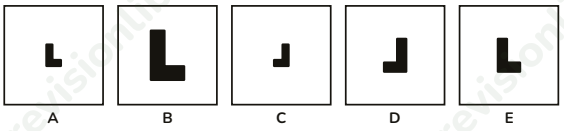
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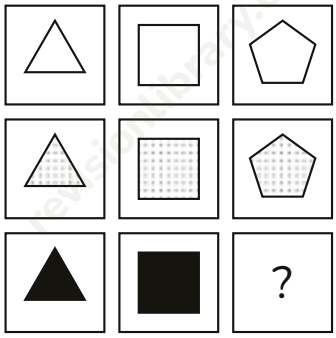


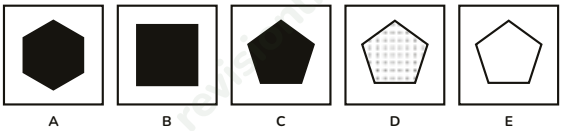
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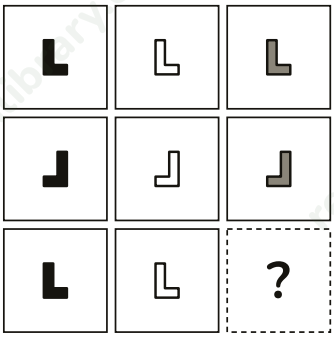
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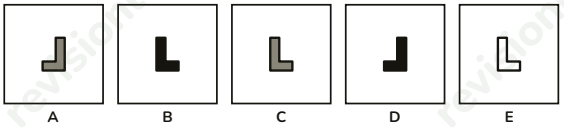




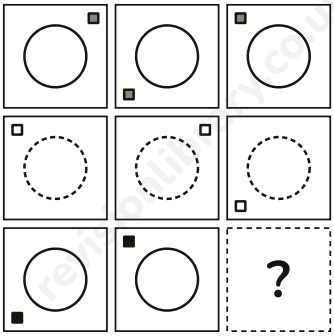
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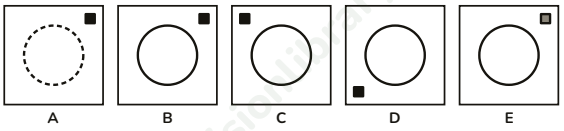
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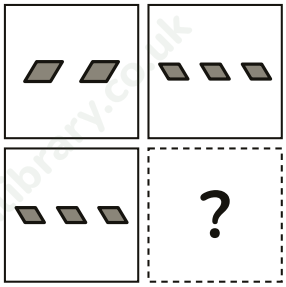


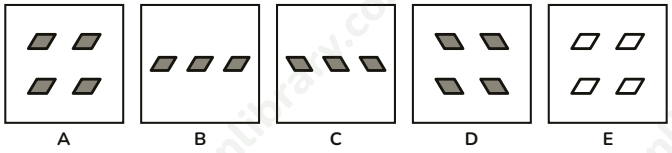
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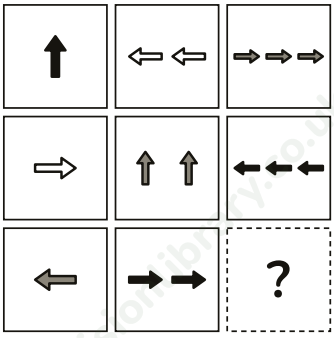


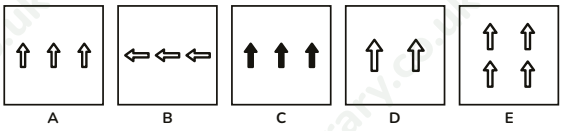
22 Study the 2x2 matrix of figures below. The bottom-right cell is missing, marked '?'. Which option completes the matrix?



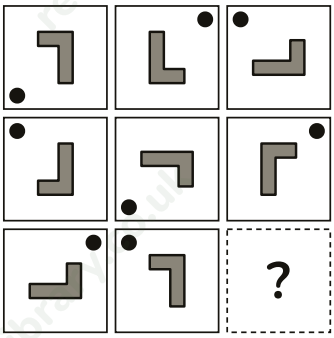


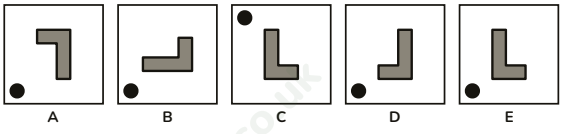
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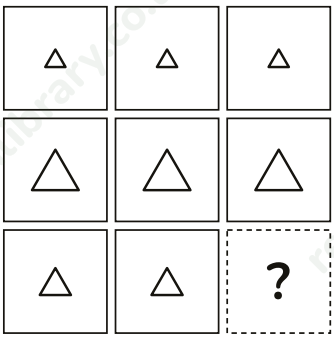
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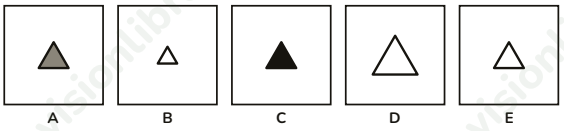




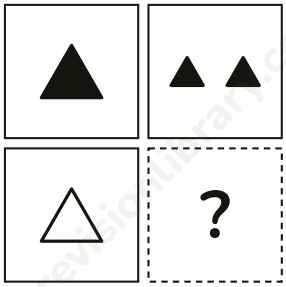
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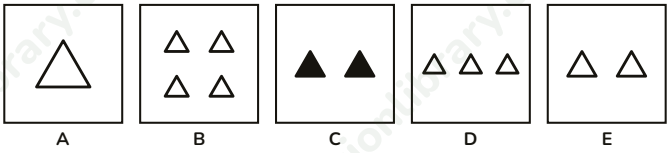
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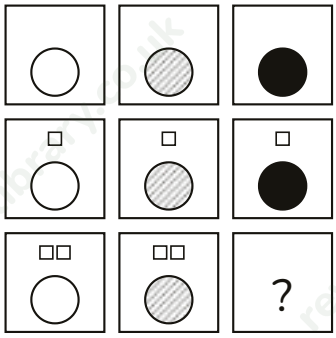


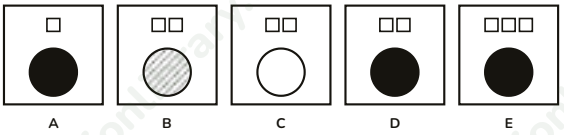
26 Study the 2x2 matrix of figures below. The bottom-right cell is missing, marked '?'. Which option completes the matrix?



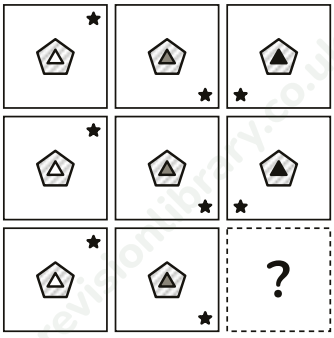


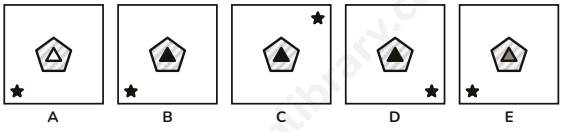
27 Study the 3x3 matrix of figures below. One rule links the figures across each row; a second rule links the figures down each column. The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.





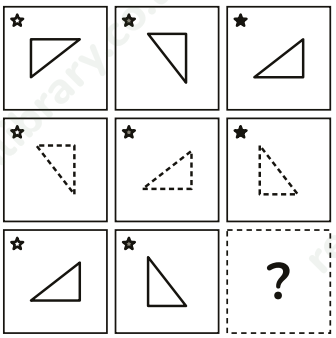
28 Study the 3x3 matrix of figures below. The bottom-right cell is missing, marked '?'. Which option completes the matrix?

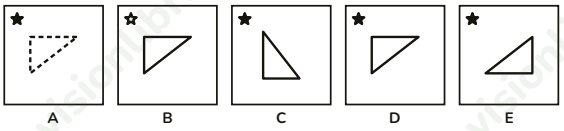




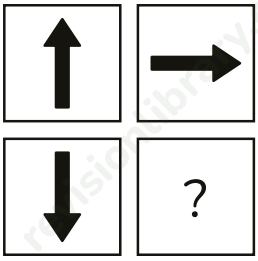
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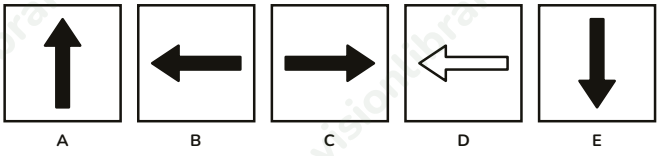
29



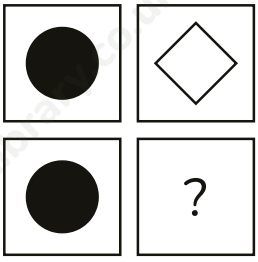


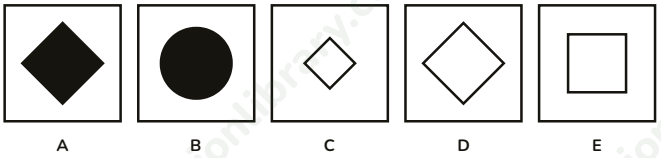
30 Study the 2x2 matrix of figures below. A single rule rotates the figure by a fixed amount as you read left to right, then continue top to bottom. The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.



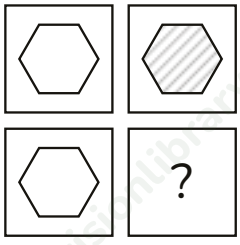


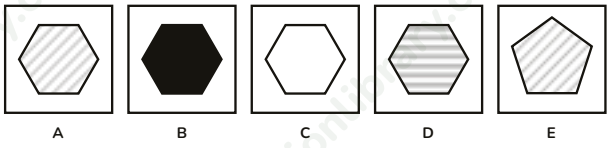
31 Study the 2x2 matrix of figures below. The bottom row repeats the pattern of the top row exactly. The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.





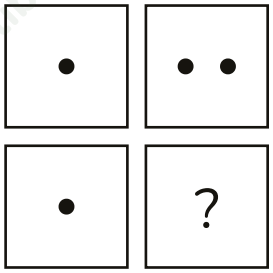
32 Study the 2x2 matrix of figures below. A single rule changes the shading of the figure as you read left to right; the bottom row repeats the same shading rule as the top row. The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.

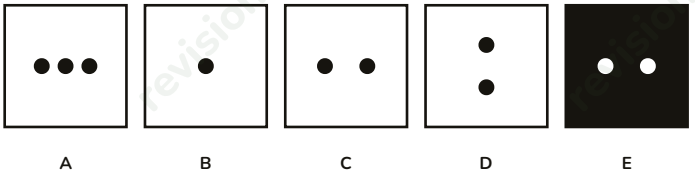




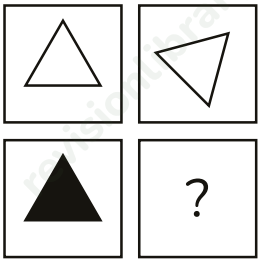
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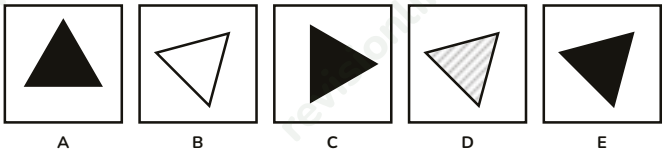
33 Study the 2x2 matrix of figures below. A single rule increases the number of dots inside the shape as you read left to right; the bottom row repeats the same rule as the top row. The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.



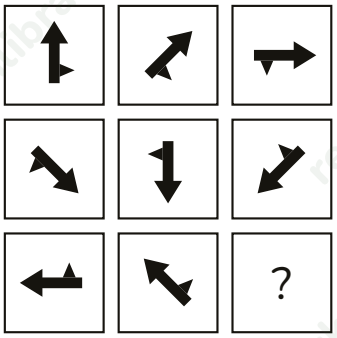


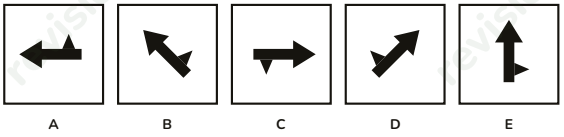
34 Study the 2x2 matrix of figures below. One rule links the two figures in each row; a separate rule links the two figures down each column. The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.



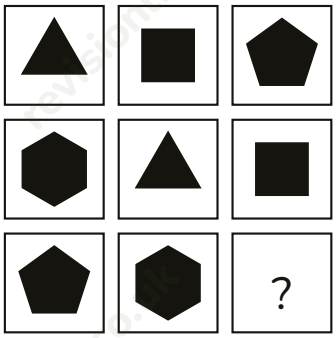


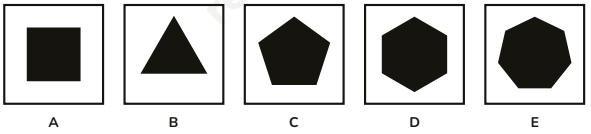
35 Study the 3x3 matrix of figures below. This matrix uses a SINGLE rule that runs through all nine cells in reading order (left to right along row 1, then left to right along row 2, then left to right along row 3). The figure rotates by a fixed amount from each cell to the next. The bottom-right cell is missing, marked '?'. Identify which option completes the sequence.





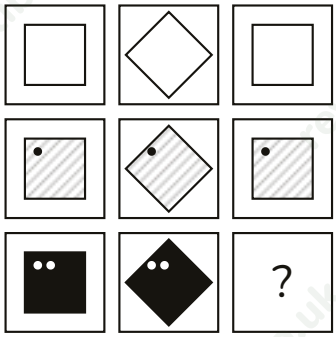
36 Study the 3x3 matrix of figures below. This matrix uses a SINGLE rule that runs through all nine cells in reading order. The number of sides of the shape follows a repeating cycle. All shapes are the same medium size, solid black fill. The bottom-right cell is missing, marked '?'. Identify which option completes the sequence.

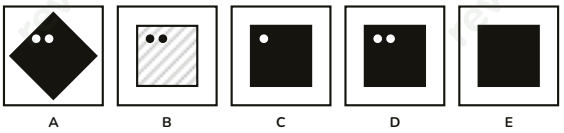




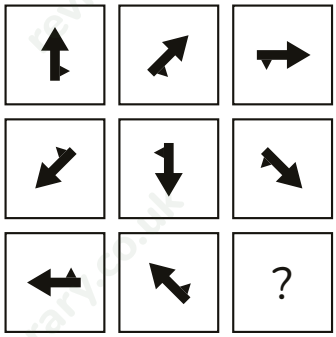
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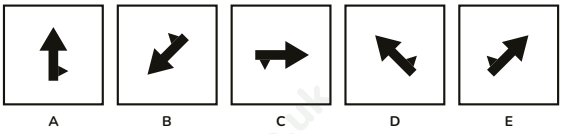
37 Study the 3x3 matrix of figures below. THREE separate rules operate together: a row rule (the shape alternates across each row), and two column rules (shading and dot-count both change down the rows). The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.



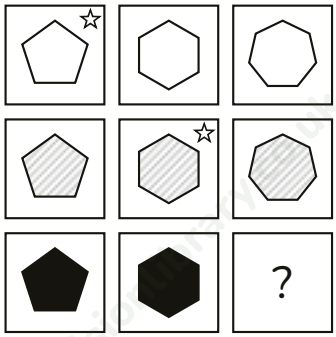


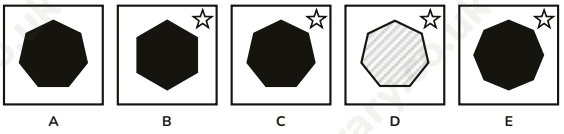
38 Study the 3x3 matrix of figures below carefully. The rotation rule does NOT follow simple reading order. Instead it follows a 'snake' path: left to right along row 1, then right to left along row 2, then left to right along row 3, rotating the figure by a fixed amount at each step along that path. The bottom-right cell is missing, marked '?'. Identify which option completes the sequence.





39 Study the 3x3 matrix of figures below. THREE rules operate together: a row rule (the number of sides increases across each row), a column rule (shading darkens down each column), and a DIAGONAL rule (the three cells running from top-left to bottom-right each carry one extra small marker not seen elsewhere in the grid). The bottom-right cell is missing, marked '?'. Identify which option completes the matrix.





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Mark scheme · 4.3 Matrices: Test Pack

Question 1

Selects C: applies the row rule (number of black points 1,2,3 clockwise from the top point) and the column rule (outline weight thin, medium, thick down rows). **B1**

Answer: C

Question 2

selects option C: the position of the small shape is the same down each column and changes from column to column, which gives A medium solid black rectangle and a small solid black square in the top-left (upright, the rectangle has its long sides horizontal) (cao) **B1**

Answer: C) A medium solid black rectangle and a small solid black square in the top-left (upright, the rectangle has its long sides horizontal)

Question 3

selects option C: the position of the small shape uses each value once in every row and every column; the outline style is the same along each row and changes from row to row, which gives A large unshaded (white) heart with its point facing down and a small solid black square in the top-right (cao) **B1**

Answer: C) A large unshaded (white) heart with its point facing down and a small solid black square in the top-right

Question 4

selects option C: the size is the same down each column and changes from column to column; the orientation is the same along each row and changes from row to row, which gives A small mid-grey flag (upright, the flag has its pole on the left, pennant pointing right from the top) (cao) **B1**

Answer: C) A small mid-grey flag (upright, the flag has its pole on the left, pennant pointing right from the top)

Question 5

selects option C: the size is the same along each row and changes from row to row; the position of the small shape is the same down each column and changes from column to column; the shading of the small shape is the same along each row and changes from row to row, which gives A small unshaded (white) diamond and a small mid-grey star with one point facing up in the top-left (cao) **B1**

Answer: C) A small unshaded (white) diamond and a small mid-grey star with one point facing up in the top-left

Question 6

Selects D: applies the row rule (rotation +90 degrees clockwise across columns) and the column rule (size small, medium, large down rows). **B1**

Answer: D

Question 7

selects option C: the mirror image is the same along each row and changes from row to row; the shading of the small shape is the same along each row and changes from row to row; the shading uses each value once in every row and every column, which gives A medium solid black right-angled triangle and a small solid black star with one point facing up in the top-left (upright, the right-angled triangle has its right angle at the bottom left, longer side along the bottom) (cao) **B1**

Answer: C) A medium solid black right-angled triangle and a small solid black star with one point facing up in the top-left (upright, the right-angled triangle has its right angle at the bottom left, longer side along the bottom)

Question 8

Selects A: applies the row rule (direction up, right, down across columns) and the column rule (shading white outline, hatched, solid black down rows). **B1**

Answer: A

Question 9

selects option B: the size is the same down each column and changes from column to column; the position of the small shape uses each value once in every row and every column, which gives A small solid black heart with its point facing down and a small solid black triangle with one point facing up in the top-right (cao) **B1**

Answer: B) A small solid black heart with its point facing down and a small solid black triangle with one point facing up in the top-right

Question 10

Selects C: applies the row rule (0,1,2 circles across columns) and the column rule (rotation +90 degrees clockwise down rows). **B1**

Answer: C

Question 11

selects option E: the shading of the inner shape uses each value once in every row and every column, which gives A medium diagonally hatched square, with a small unshaded (white) circle centred inside it (cao) **B1**

Answer: E) A medium diagonally hatched square, with a small unshaded (white) circle centred inside it

Question 12

selects option D: the shading of the inner shape is the same down each column and changes from column to column, which gives A large diagonally hatched circle, with a small unshaded (white) diamond centred inside it (cao) **B1**

Answer: D) A large diagonally hatched circle, with a small unshaded (white) diamond centred inside it

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Question 13

selects option D: the outline style alternates in a checkerboard pattern; the shape is the same along each row and changes from row to row, which gives A large unshaded (white) cross (cao) **B1**

Answer: D) A large unshaded (white) cross

Question 14

selects option E: the mirror image is the same along each row and changes from row to row; the shading is the same along each row and changes from row to row; the orientation is the same along each row and changes from row to row, which gives A large mid-grey right-angled triangle (turned 270 degrees clockwise) (upright, the right-angled triangle has its right angle at the bottom left, longer side along the bottom) (cao) **B1**

Answer: E) A large mid-grey right-angled triangle (turned 270 degrees clockwise) (upright, the right-angled triangle has its right angle at the bottom left, longer side along the bottom)

Question 15

Selects D: applies the row rule (outline style solid, dashed, dotted across columns) and the column rule (fill black, white, diagonally hatched down rows). **B1**

Answer: D

Question 16

selects option D: the shape uses each value once in every row and every column, which gives A large mid-grey square (cao) **B1**

Answer: D) A large mid-grey square

Question 17

Selects A: applies the row rule (inner square shading white, hatched, black across columns) and the column rule (inner square size small, medium, large down rows), while the outer circle stays constant. **B1**

Answer: A

Question 18

selects option A: the mirror image is the same down each column and changes from column to column; the size is the same along each row and changes from row to row, which gives A small solid black L-shape (upright, the L-shape has its tall arm on the left, foot pointing right along the bottom) (cao) **B1**

Answer: A) A small solid black L-shape (upright, the L-shape has its tall arm on the left, foot pointing right along the bottom)

Question 19

Selects C: applies the row rule (shape fixed per column: triangle, square, pentagon) and the column rule (shading white, stippled, solid black down rows). **B1**

Answer: C

Question 20

selects option C: the mirror image is the same along each row and changes from row to row; the shading is the same down each column and changes from column to column, which gives A medium mid-grey L-shape (upright, the L-shape has its tall arm on the left, foot pointing right along the bottom) (cao) **B1**

Answer: C) A medium mid-grey L-shape (upright, the L-shape has its tall arm on the left, foot pointing right along the bottom)

Question 21

selects option B: the outline style is the same along each row and changes from row to row; the shading of the small shape is the same along each row and changes from row to row; the position of the small shape uses each value once in every row and every column, which gives A large unshaded (white) circle and a small solid black square in the top-right (cao) **B1**

Answer: B) A large unshaded (white) circle and a small solid black square in the top-right

Question 22

selects option A: the number of shapes changes by the same step along rows and down columns; the mirror image alternates in a checkerboard pattern, which gives Four small mid-grey parallelograms arranged in a block (upright, the parallelogram has its long sides horizontal, slanting up to the right) (cao) **B1**

Answer: A) Four small mid-grey parallelograms arranged in a block (upright, the parallelogram has its long sides horizontal, slanting up to the right)

Question 23

selects option A: the shading uses each value once in every row and every column; the number of shapes is the same down each column and changes from column to column; the orientation uses each value once in every row and every column, which gives Three small unshaded (white) arrows pointing up side by side in a row (cao) **B1**

Answer: A) Three small unshaded (white) arrows pointing up side by side in a row

Question 24

selects option E: the position of the small shape uses each value once in every row and every column; the orientation uses each value once in every row and every column; the mirror image is the same along each row and changes from row to row, which gives A large mid-grey L-shape and a small solid black circle in the bottom-left (upright, the L-shape has its tall arm on the left, foot pointing right along the bottom) (cao) **B1**

Answer: E) A large mid-grey L-shape and a small solid black circle in the bottom-left (upright, the L-shape has its tall arm on the left, foot pointing right along the bottom)

Question 25

selects option E: the size is the same along each row and changes from row to row, which gives A medium unshaded (white) triangle with one point facing up (cao) **B1**

Answer: E) A medium unshaded (white) triangle with one point facing up

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Question 26

selects option E: the number of shapes is the same down each column and changes from column to column; the shading is the same along each row and changes from row to row, which gives Two small unshaded (white) triangles with one point facing up side by side in a row (cao) **B1**

Answer: E) Two small unshaded (white) triangles with one point facing up side by side in a row

Question 27

Selects D: applies the row shading rule (white, hatched, black across columns) and the column rule (0,1,2 small squares above the circle down rows). **B1**

Answer: D

Question 28

selects option B: the position of the small shape is the same down each column and changes from column to column; the shading of the inner shape is the same down each column and changes from column to column, which gives A medium diagonally hatched pentagon with one point facing up, with a small solid black triangle with one point facing up centred inside it and a small solid black star with one point facing up in the bottom-left (cao) **B1**

Answer: B) A medium diagonally hatched pentagon with one point facing up, with a small solid black triangle with one point facing up centred inside it and a small solid black star with one point facing up in the bottom-left

Question 29

selects option D: the shading of the small shape is the same down each column and changes from column to column; the orientation changes by the same step along rows and down columns; the outline style is the same along each row and changes from row to row, which gives A large unshaded (white) right-angled triangle (turned 90 degrees clockwise) and a small solid black star with one point facing up in the top-left (upright, the right-angled triangle has its right angle at the bottom left, longer side along the bottom) (cao) **B1**

Answer: D) A large unshaded (white) right-angled triangle (turned 90 degrees clockwise) and a small solid black star with one point facing up in the top-left (upright, the right-angled triangle has its right angle at the bottom left, longer side along the bottom)

Question 30

Selects B: continues the single 90 degree clockwise rotation sequence (up, right, down, left) to give an arrow pointing left. **B1**

Answer: B

Question 31

Selects D: the bottom row must repeat the top row exactly, so the missing figure equals the top-right figure (white diamond). **B1**

Answer: D

Question 32

Selects A: the row rule (white to diagonal hatching) applies in the bottom row exactly as in the top row. **B1**

Answer: A

Question 33

Selects C: the bottom row repeats the top row's dot-count rule (1 dot then 2 dots side by side). **B1**

Answer: C

Question 34

Selects E: applies the row rotation rule (+45 degrees clockwise) together with the column shading rule (white to black). **B1**

Answer: E

Question 35

Selects E: recognises that the single rotation sequence (+45 degrees clockwise per cell, reading order) completes a full 360 degree turn after 8 steps, returning to the starting orientation (up) at the 9th cell. **B1**

Answer: E

Question 36

Selects B: recognises the repeating 4-term cycle (3,4,5,6 sides) and identifies that cell 9 is the 1st term of the cycle repeated (3 sides). **B1**

Answer: B

Question 37

Selects D: applies the row rule (shape alternates square, diamond, square across columns, so column 3 is always a square), the column shading rule (white, hatched, black down rows) and the column dot-count rule (0,1,2 dots down rows), while noting the dots must contrast with the black fill. **B1**

Answer: D

Question 38

Selects A: correctly traces the snake path (row 1 left-to-right, row 2 right-to-left, row 3 left-to-right) and continues the +45 degree clockwise rotation to complete a full 360 degree turn, returning to the starting orientation (up). **B1**

Answer: A

Question 39

Selects C: applies the row rule (sides 5,6,7 across columns, so column 3 is always a heptagon), the column rule (shading white, hatched, black down rows, so row 3 is solid black) and the diagonal rule (cell (3,3) lies on the main diagonal so it must carry the small star marker). **B1**

Answer: C

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