

GCSE MATHS • GRADE 3

MATHS



MODEL ANSWERS

ROTATIONS

SCORE

/92

PERCENTAGE

%

STEM UP

- 1 The point P has coordinates (1, 1).
P is rotated 90° clockwise about the origin O.
Write down the coordinates of the image of P.

Rotate P about the centre

(1, -1)

1 / 1

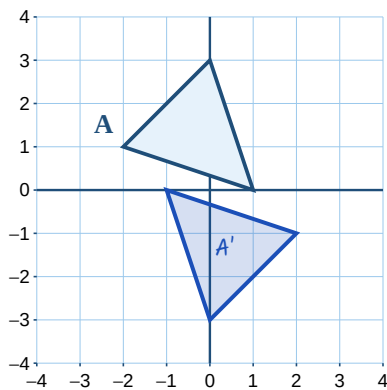
- 2 Triangle ABC has vertices A(-1, 0), B(1, 0), C(1, -3).
It is rotated 90° anticlockwise about the origin O.
Write down the coordinates of A', B' and C'.

Rotate each vertex about O

A'(0, -1), B'(0, 1), C'(3, 1)

1 / 1

- 3 Rotate shape A 180° about the origin O.



1 / 1

- 4 The point P has coordinates $(-5, -5)$.
P is rotated 90° anticlockwise about the origin O.
Write down the coordinates of the image of P.

Rotate P about the centre

$(5, -5)$

/ 1

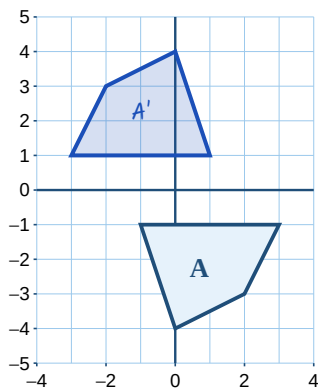
- 5 Triangle ABC has vertices $A(1, -1)$, $B(1, 3)$, $C(-2, 0)$.
It is rotated 180° about the origin O.
Write down the coordinates of A' , B' and C' .

Rotate each vertex about O

$A'(-1, 1)$, $B'(-1, -3)$, $C'(2, 0)$

/ 1

- 6 Rotate shape A 180° about the origin O.



/ 1

- 7 The point P has coordinates $(-3, -3)$.
P is rotated 90° anticlockwise about the origin O.
Write down the coordinates of the image of P.

Rotate P about the centre

$(3, -3)$

/ 1

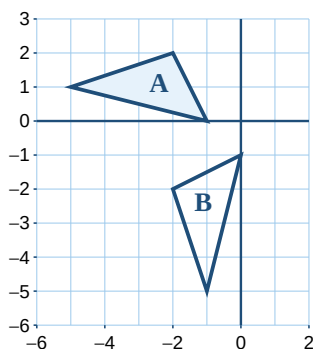
- 8 Triangle ABC has vertices $A(-2, -1)$, $B(-4, -1)$, $C(-4, 2)$.
It is rotated 180° about the origin O.
Write down the coordinates of A' , B' and C' .

Rotate each vertex about O

$A'(2, 1)$, $B'(4, 1)$, $C'(4, -2)$

/ 1

- 9 Shape A is rotated about the origin O onto shape B.
Write down the angle and the direction of the rotation.



Follow one vertex of A to the same vertex of B

90° anticlockwise

/ 1

- 10** The point P has coordinates (4, 4).
 P is rotated 180° about the point (0, -2).
 Write down the coordinates of the image of P.

Rotate P about the centre

$(-4, -8)$

/ 1

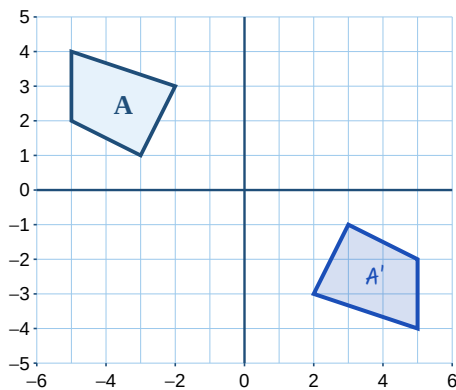
- 11** Triangle ABC has vertices A(-3, -2), B(-3, -4), C(0, -4).
 It is rotated 180° about the origin O.
 Write down the coordinates of A', B' and C'.

Rotate each vertex about O

$A'(3, 2), B'(3, 4), C'(0, 4)$

/ 1

- 12** Rotate shape A 180° about the origin O.



/ 1

- 13** The point P has coordinates $(0, -4)$.
 P is rotated 90° clockwise about the point $(-1, -2)$.
 Write down the coordinates of the image of P.

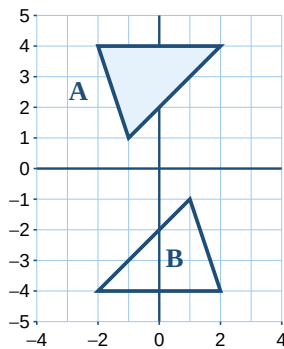
Rotate P about the centre

$(-3, -3)$

/ 1

- 14** Shape A is rotated about the origin O onto shape B.
 Write down the angle and the direction of the rotation.

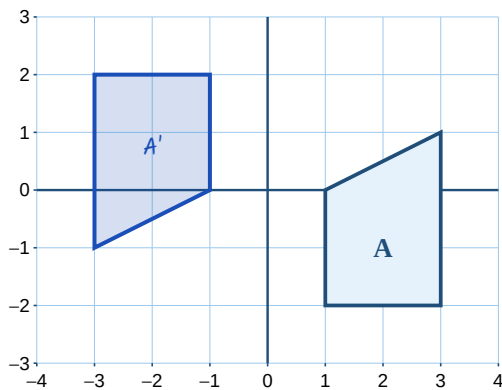
Follow one vertex of A to the same vertex of B



180°

/ 1

- 15** Rotate shape A 180° about the origin O.



/ 1

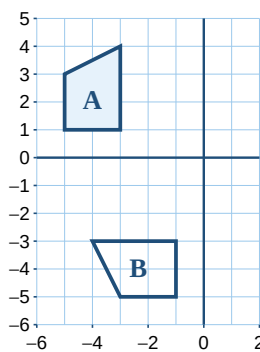
- 16** The point P has coordinates $(3, -6)$.
 P is rotated 180° about the point $(2, 2)$.
 Write down the coordinates of the image of P.

Rotate P about the centre

$(1, 10)$

/ 1

- 17** Shape A is rotated about the origin O onto shape B.
 Write down the angle and the direction of the rotation.

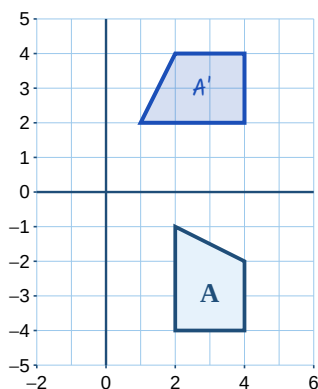


Follow one vertex of A to the same vertex of B

90° anticlockwise

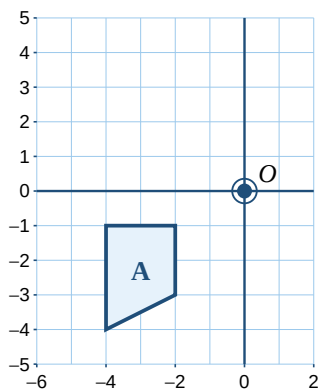
/ 1

- 18** Rotate shape A 90° anticlockwise about the origin O.



/ 1

- 19 Rotate shape A 90° clockwise about the origin O.



Each vertex (x, y) maps to $(y, -x)$ for a 90° clockwise turn about O

Image vertices: $(-4, 4)$, $(-1, 4)$,
 $(-1, 2)$, $(-3, 2)$

/ 1

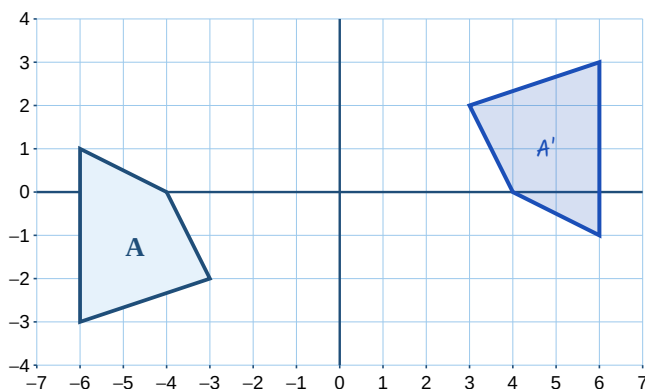
- 20 Shape A is rotated 90° clockwise about the point $(0, 3)$ to give shape B.
 Describe fully the single transformation that maps shape B onto shape A.

The reverse rotation has the same centre and angle but opposite direction

Rotation, 90° anticlockwise,
 centre $(0, 3)$

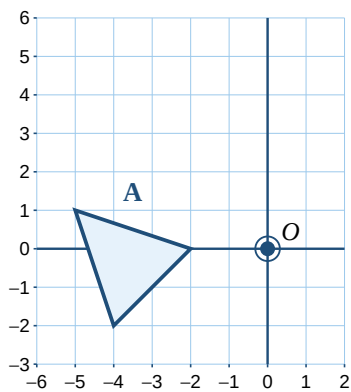
/ 1

- 21 Rotate shape A 180° about the origin O.



/ 2

- 22 Rotate shape A 90° clockwise about the origin O.



Each vertex (x, y) maps to $(y, -x)$ for a 90° clockwise turn about O

Image vertices: $(1, 5)$, $(0, 2)$,
 $(-2, 4)$

2 / 2

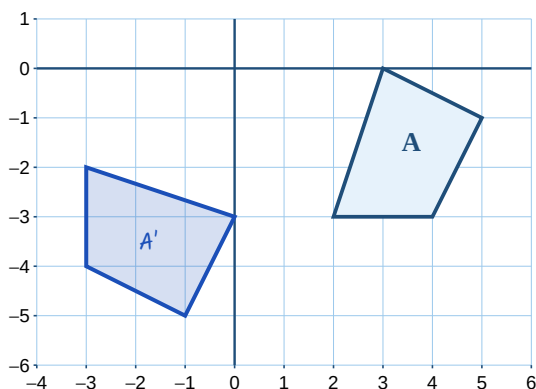
- 23 Shape A is rotated 90° clockwise about the point $(1, 3)$ to give shape B.
Describe fully the single transformation that maps shape B onto shape A.

The reverse rotation has the same centre and angle but opposite direction

Rotation, 90° anticlockwise,
centre $(1, 3)$

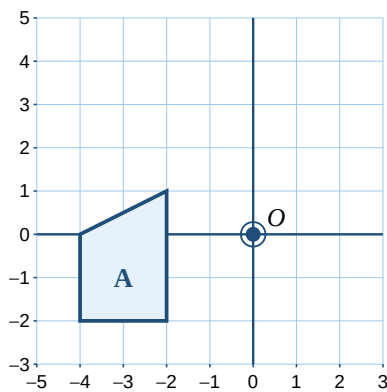
2 / 2

- 24 Rotate shape A 90° clockwise about the origin O.



2 / 2

- 25 Rotate shape A 90° clockwise about the origin O.



Each vertex (x, y) maps to $(y, -x)$ for a 90° clockwise turn about O

Image vertices: $(1, 2)$, $(-2, 2)$,
 $(-2, 4)$, $(0, 4)$

2 / 2

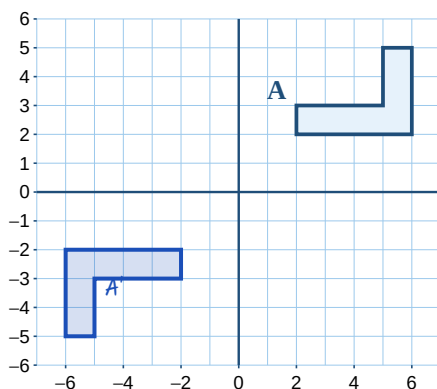
- 26 Shape A is rotated 90° clockwise about the point $(-3, 1)$ to give shape B.
Describe fully the single transformation that maps shape B onto shape A.

The reverse rotation has the same centre and angle but opposite direction

Rotation, 90° anticlockwise,
centre $(-3, 1)$

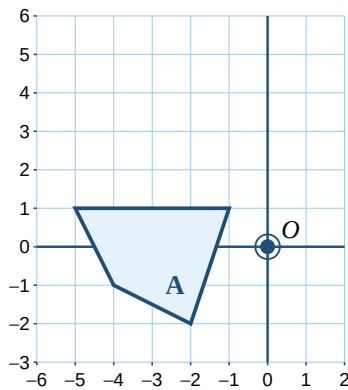
2 / 2

- 27 Rotate shape A 180° about the origin O.



2 / 2

- 28 Rotate shape A 90° clockwise about the origin O.



Each vertex (x, y) maps to $(y, -x)$ for a 90° clockwise turn about O

Image vertices: $(1, 1)$, $(1, 5)$,
 $(-1, 4)$, $(-2, 2)$

2 / 2

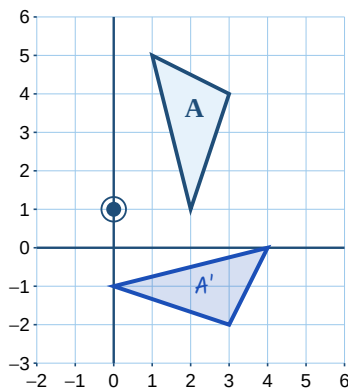
- 29 Shape A is rotated 90° clockwise about the point $(3, 3)$ to give shape B.
Describe fully the single transformation that maps shape B onto shape A.

The reverse rotation has the same centre and angle but opposite direction

Rotation, 90° anticlockwise,
centre $(3, 3)$

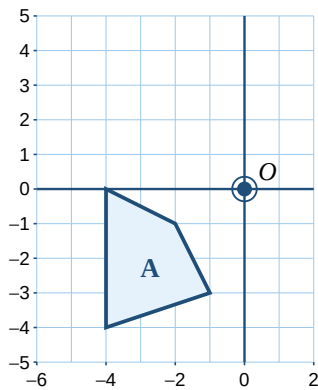
2 / 2

- 30 Rotate shape A 90° clockwise about the point $(0, 1)$.



2 / 2

- 31 Rotate shape A 90° clockwise about the origin O.

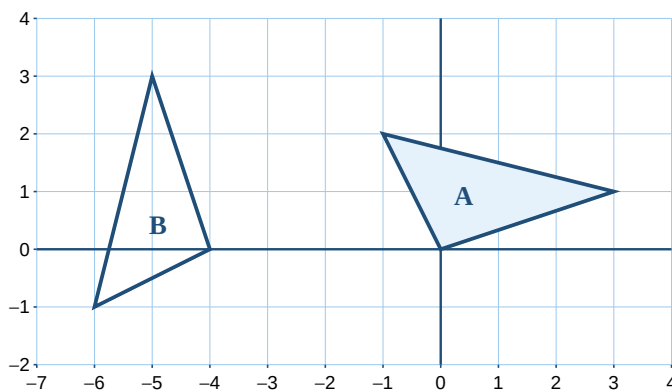


Each vertex (x, y) maps to $(y, -x)$ for a 90° clockwise turn about O

Image vertices: $(-4, 4)$, $(0, 4)$,
 $(-1, 2)$, $(-3, 1)$

2 / 2

- 32 Describe fully the rotation that maps shape A onto shape B.

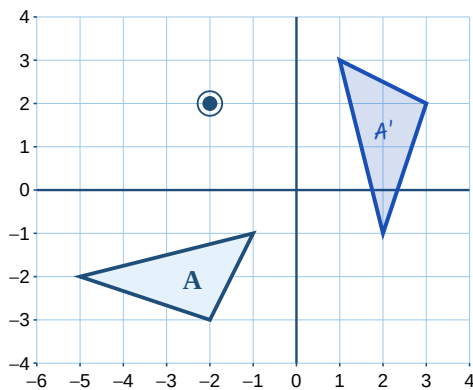


Find the angle and direction, then find the centre by trial

Rotation, 90° anticlockwise, centre $(-2, -2)$

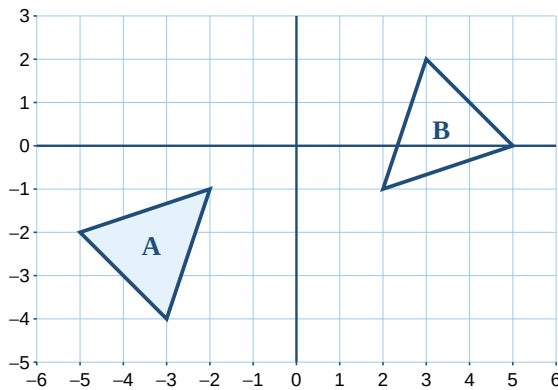
2 / 2

- 33 Rotate shape A 90° anticlockwise about the point $(-2, 2)$.



2 / 2

- 34 Describe fully the single transformation that maps shape A onto shape B.

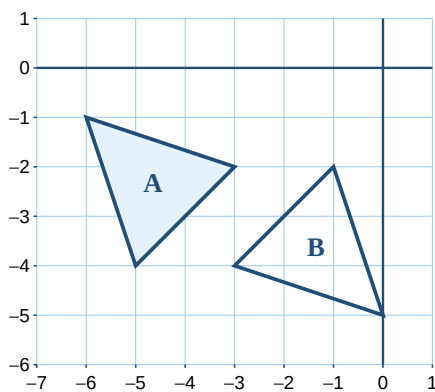


Find the angle and direction, then find the centre by trial

Rotation, 180° , centre $(0, -1)$

2 / 2

- 35 Describe fully the rotation that maps shape A onto shape B.

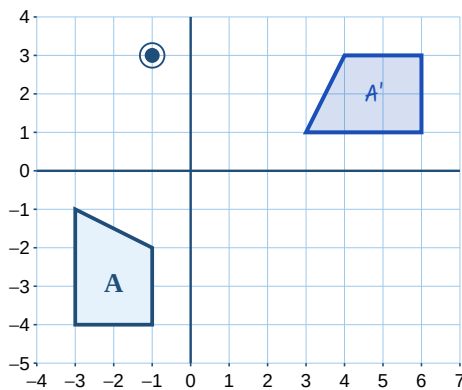


Find the angle and direction, then find the centre by trial

Rotation, 180° , centre $(-3, -3)$

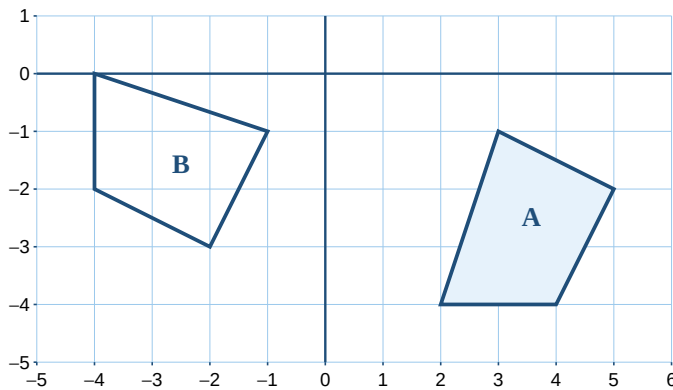
2 / 2

- 36 Rotate shape A 90° anticlockwise about the point $(-1, 3)$.



2 / 2

- 37 Describe fully the single transformation that maps shape A onto shape B.

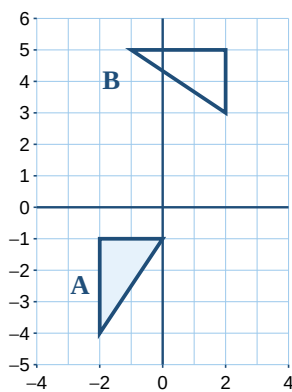


Find the angle and direction, then find the centre by trial

Rotation, 90° clockwise, centre (1, 1)

2 / 2

- 38 Describe fully the rotation that maps shape A onto shape B.

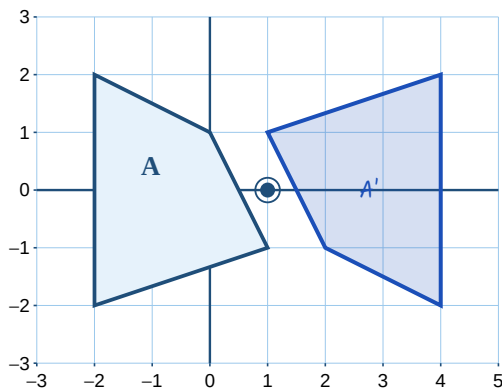


Find the angle and direction, then find the centre by trial

Rotation, 90° clockwise, centre (3, 0)

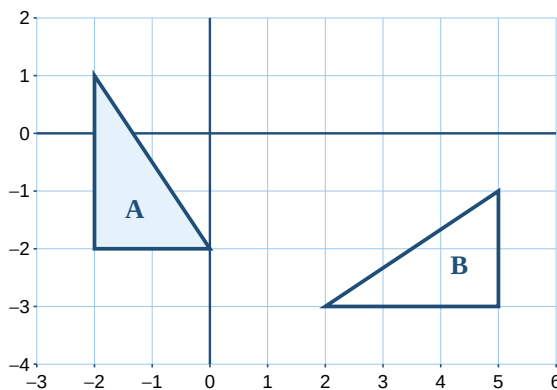
2 / 2

- 39 Rotate shape A 180° about the point (1, 0).



3 / 3

- 40 Describe fully the single transformation that maps shape A onto shape B.

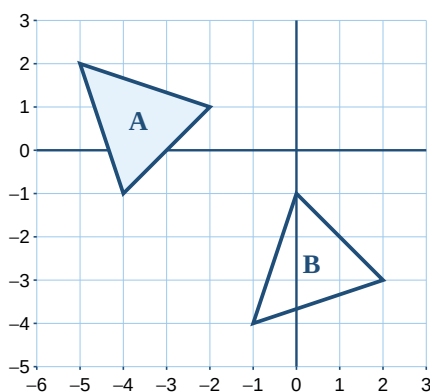


*Find the angle and direction, then
find the centre by trial*

*Rotation, 90° anticlockwise,
centre (2, 1)*

3 / 3

- 41 Describe fully the single transformation that maps shape A onto shape B.

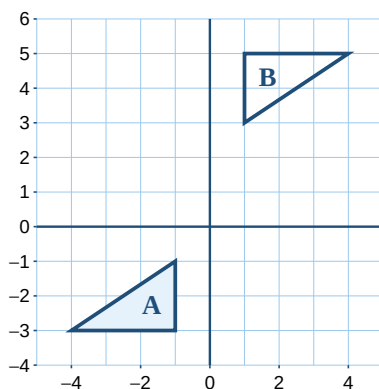


*Compare one vertex of A with the same
vertex of B to find the angle and direction
the centre is found by trial (tracing paper)*

*Rotation, 90° anticlockwise,
centre (0, 1)*

3 / 3

- 42 Describe fully the single transformation that maps shape A onto shape B.

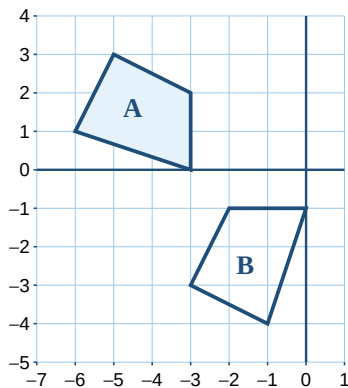


*Find the angle and direction, then find the
centre by trial*

Rotation, 180° , centre (0, 1)

3 / 3

- 43 Describe fully the single transformation that maps shape A onto shape B.

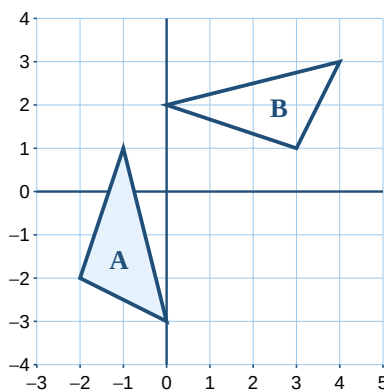


Find the angle and direction, then find the centre by trial

*Rotation, 90° anticlockwise,
centre $(-1, 1)$*

3 / 3

- 44 Describe fully the single transformation that maps shape A onto shape B.

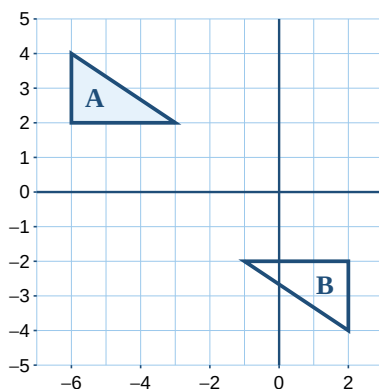


*Compare one vertex of A with the same vertex of B to find the angle and direction
the centre is found by trial (tracing paper)*

*Rotation, 90° anticlockwise,
centre $(-1, 2)$*

3 / 3

- 45 Describe fully the single transformation that maps shape A onto shape B.

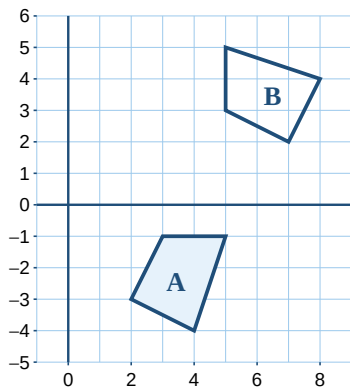


Find the angle and direction, then find the centre by trial

Rotation, 180° , centre $(-2, 0)$

3 / 3

- 46 Describe fully the single transformation that maps shape A onto shape B.

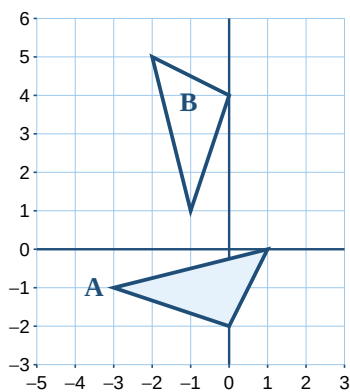


Find the angle and direction, then find the centre by trial

*Rotation, 90° anticlockwise,
centre (2, 2)*

3 / 3

- 47 Describe fully the single transformation that maps shape A onto shape B.

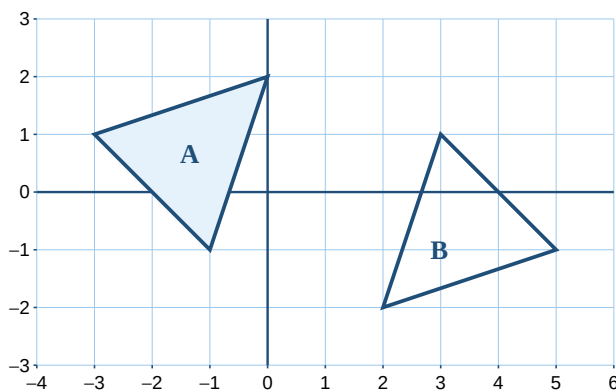


*Compare one vertex of A with the same vertex of B to find the angle and direction
the centre is found by trial (tracing paper)*

*Rotation, 90° anticlockwise,
centre (-3, 1)*

3 / 3

- 48 Describe fully the single transformation that maps shape A onto shape B.

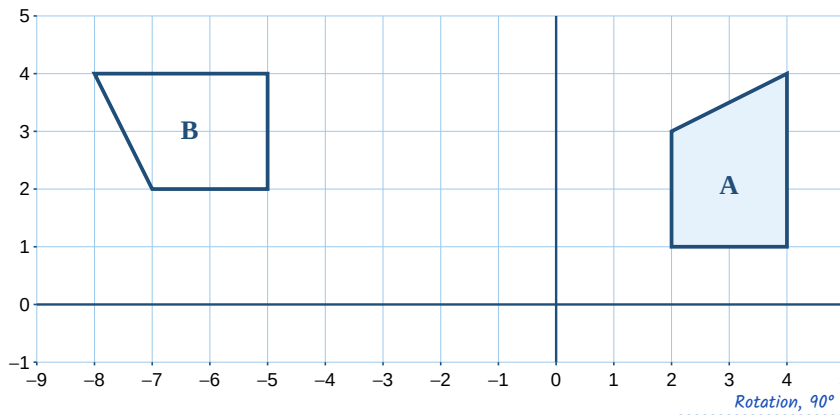


*Find the angle and direction,
then find the centre by trial*

Rotation, 180° , centre (1, 0)

3 / 3

- 49 Describe fully the single transformation that maps shape A onto shape B.

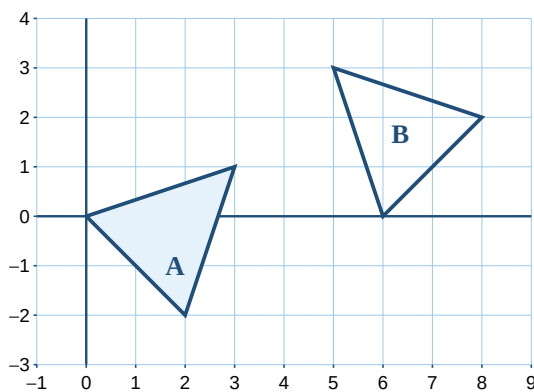


Compare one vertex of A with the same vertex of B to find the angle and direction the centre is found by trial (tracing paper)

Rotation, 90° anticlockwise, centre $(-2, -2)$

3 / 3

- 50 Describe fully the single transformation that maps shape A onto shape B.



Compare one vertex of A with the same vertex of B to find the angle and direction the centre is found by trial (tracing paper)

Rotation, 90° anticlockwise, centre $(3, 3)$

3 / 3