St. Mary's Catholic High School, Muhaisnah

Rotation

LO: To identify draw and describe rotation around a center of rotation

Lesson Objectives:

Developing students will be able to identify rotational symmetry of objects.

Secure students will be able to draw rotations around a centre of rotation.

Excelling students will be able to fully describe rotations.

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KEYWORDS:

Rotation, symmetry, degrees, turn, (anti-)clockwise, center, coordinate, quarter, half

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Rotation, symmetry, degrees, turn, (anti-)clockwise, centre, coordinate, quarter, half

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MENTAL MATH

LO: To identify draw and describe rotation around a center of rotation

TASK

1) Simplify: 9b - 7c – 6b + 5c

= 3b - 2c

2) (a) Round 6.61 to 1d.p = 6.6

(b) Round 24.288 to 2d.p = 24.29

3) Value of 5d - 2 when d = -3

= 5 x -3 - 2 = -15 - 2 = -17 (Replace d with -3)

4)
$$\begin{array}{r} 0\,5.4\,7 \\ +\,1\,4.9\,0 \\ \hline 2\,0.3\,7 \end{array}$$

5)
$$\begin{array}{r} 3\,2.6\,0 \\ -\,1\,7.9\,5 \\ \hline 1\,4.6\,5 \end{array}$$

5) 1152

8 | 9 12 4 16

Answer = 1152

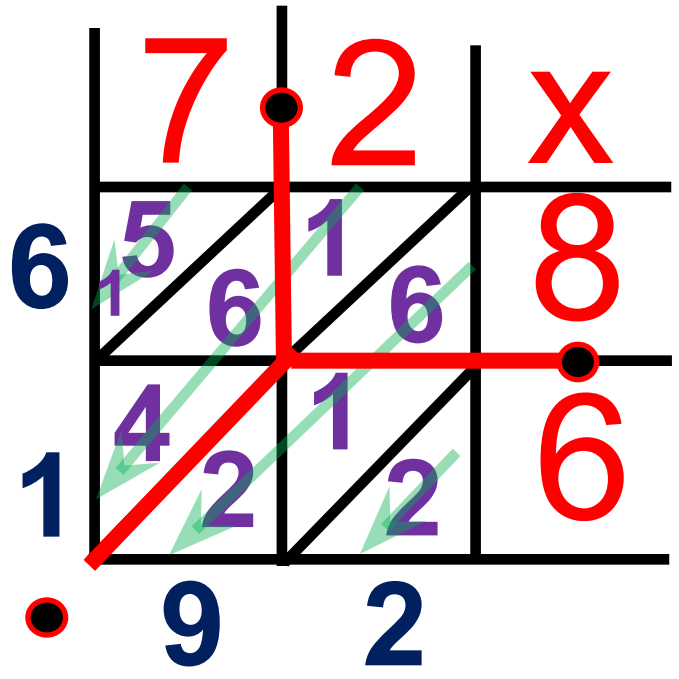
6) Expand and simplify: 6(y - 4) - 5

= 6y - 24 - 5

6y - 29

EXTENSION

1) Work out without a calculator: 7.2 x 8.6



ANSWER = 61.92

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Rotation is a type of transformation.

A rotation turns an object. The size and shape stay exactly the same but the orientation changes.

We describe rotations with an angle, a direction and a centre.

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Rotation

LO: To identify draw and describe rotation around a center of rotation

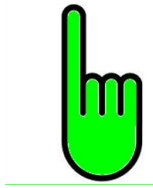
INTRODUCTION

ROTATION → **Turns a shape about a fixed point**

Three things you need to know

1) Direction → Clockwise  Anti-clockwise 

2) Angle →

90°  Quarter turn

180°  Half turn

270°  Three-quarters turn

360°  Full turn

3) Centre of rotation → The point where you rotate from.

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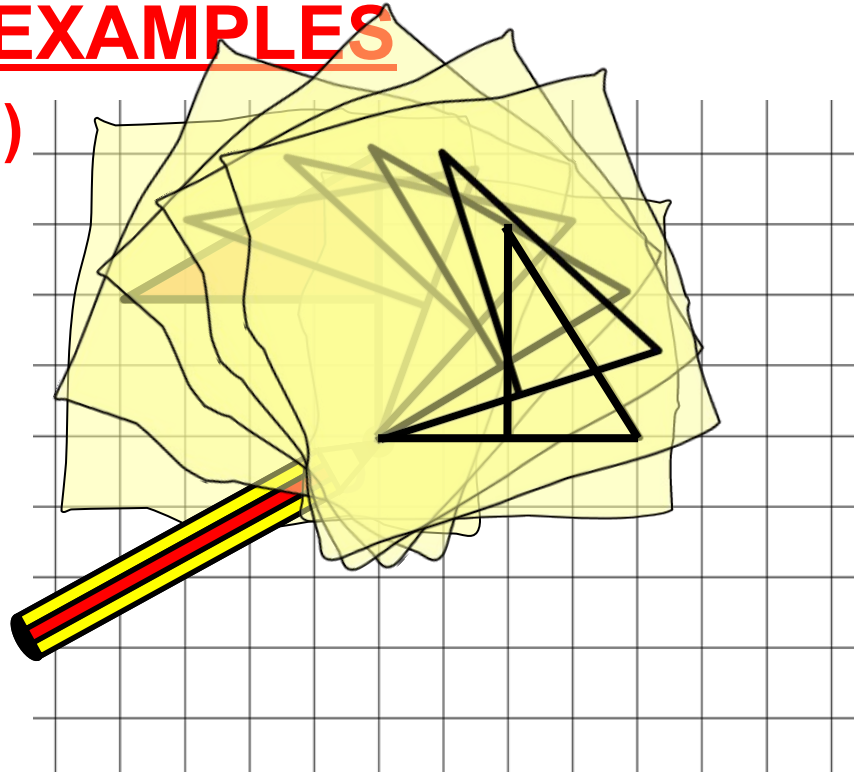
ROTATIONS

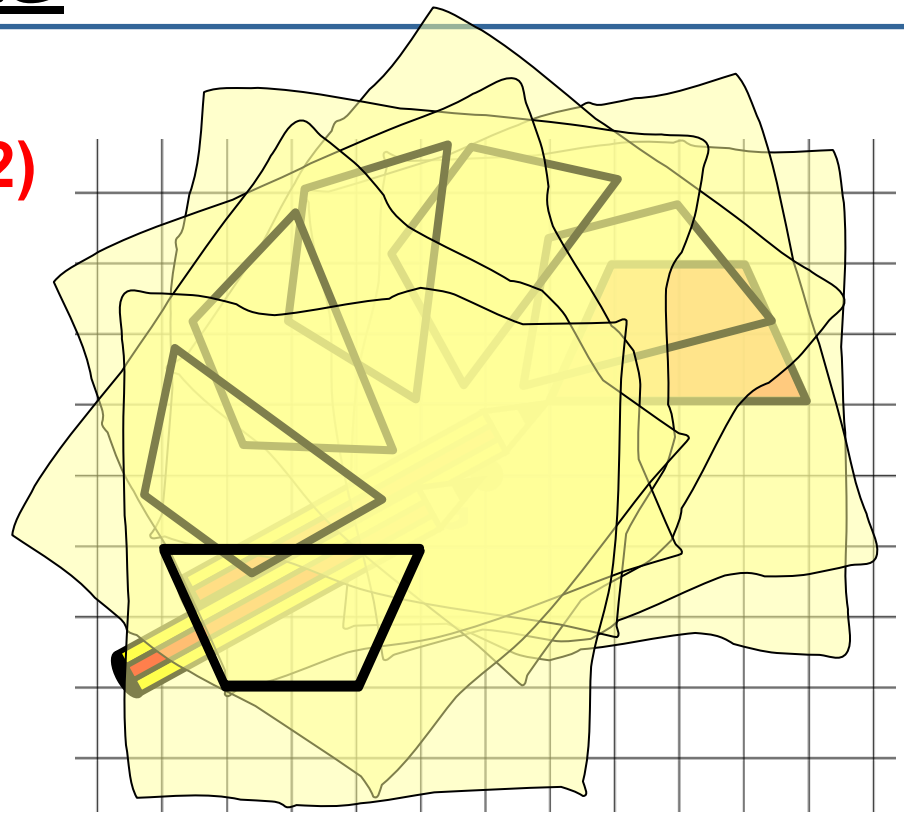
EXAMPLES

1)



Rotate this shape clockwise 90^0 about the point **O**.

2)



Rotate this shape anticlockwise 180^0 about the point **G**.

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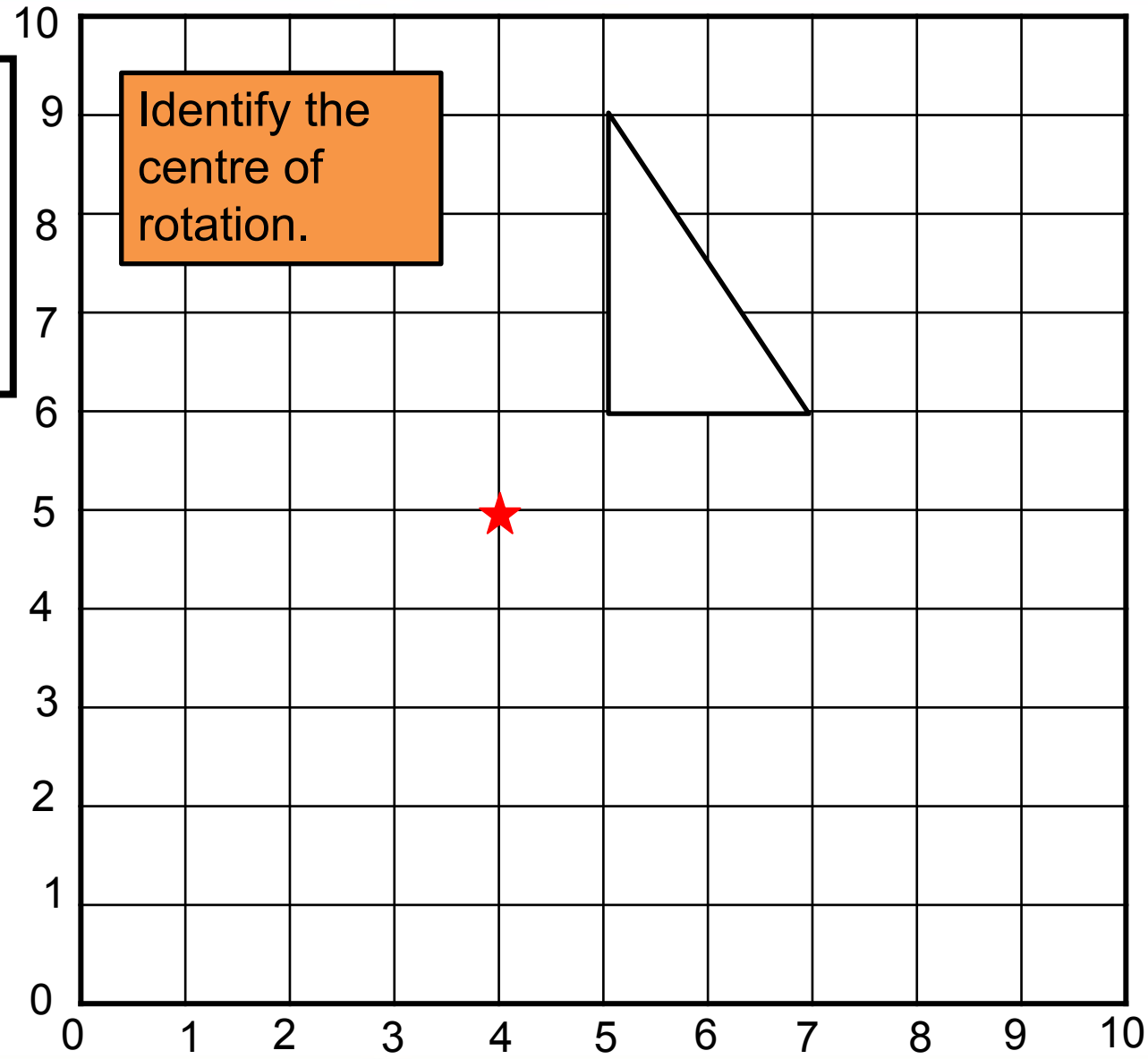
My Turn

LO: To identify draw and describe rotation around a center of rotation

Transform this triangle by the rotation:

90° clockwise around (4, 5)

Identify the centre of rotation.



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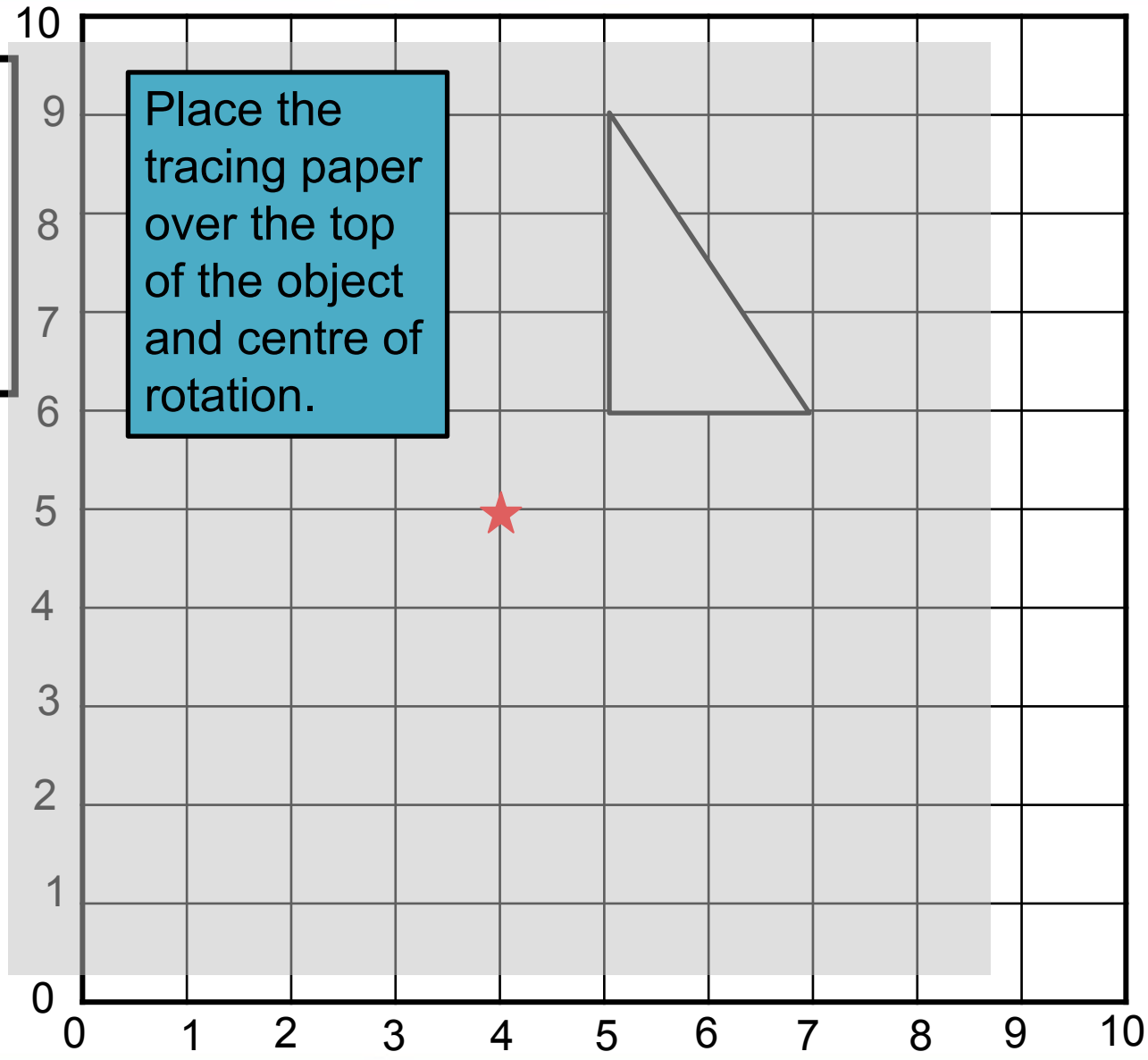
My Turn

LO: To identify draw and describe rotation around a center of rotation

Transform this triangle by the rotation:

90° clockwise around (4, 5)

Place the tracing paper over the top of the object and centre of rotation.



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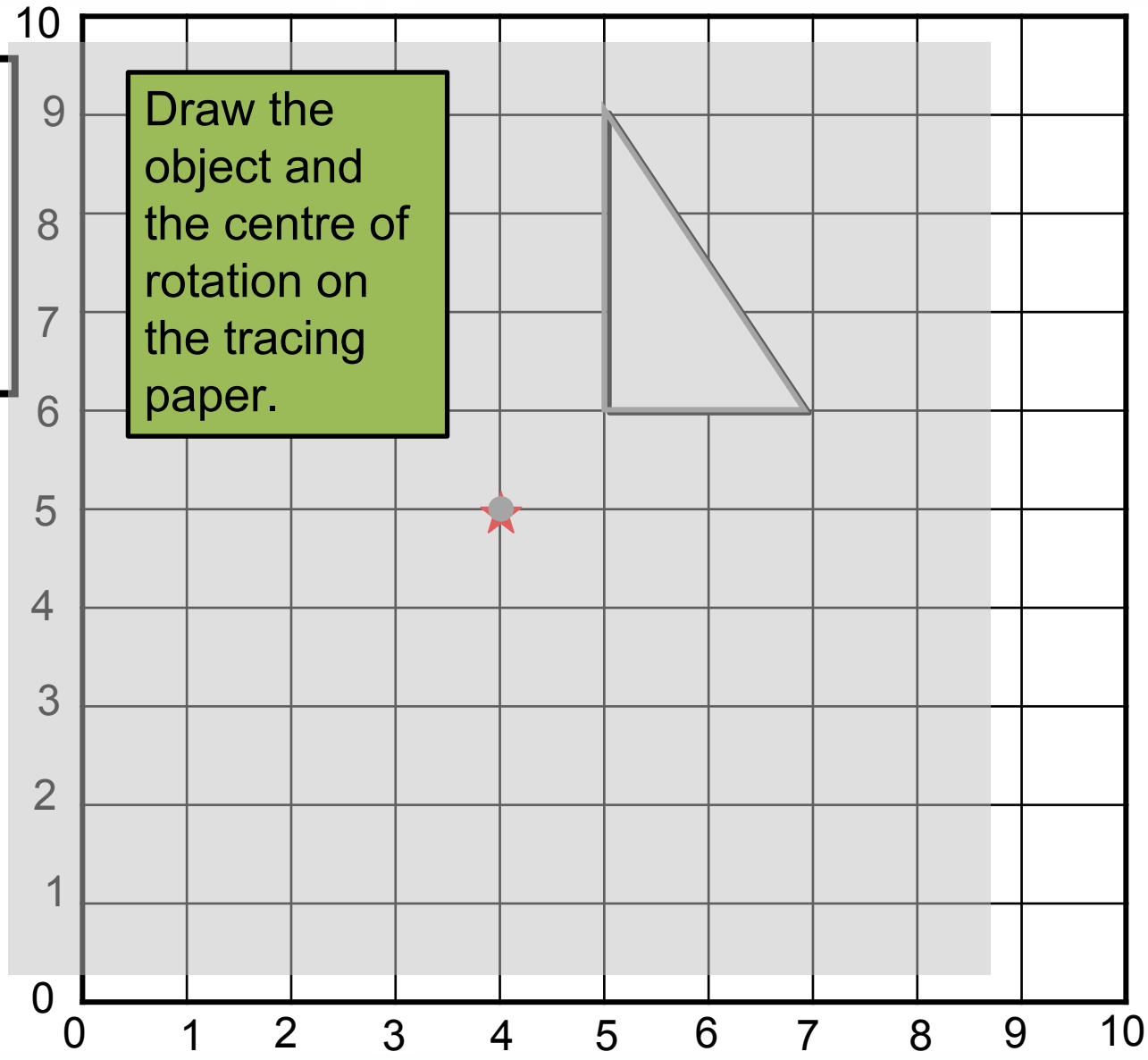
My Turn

LO: To identify draw and describe rotation around a center of rotation

Transform this triangle by the rotation:

90° clockwise around (4, 5)

Draw the object and the centre of rotation on the tracing paper.



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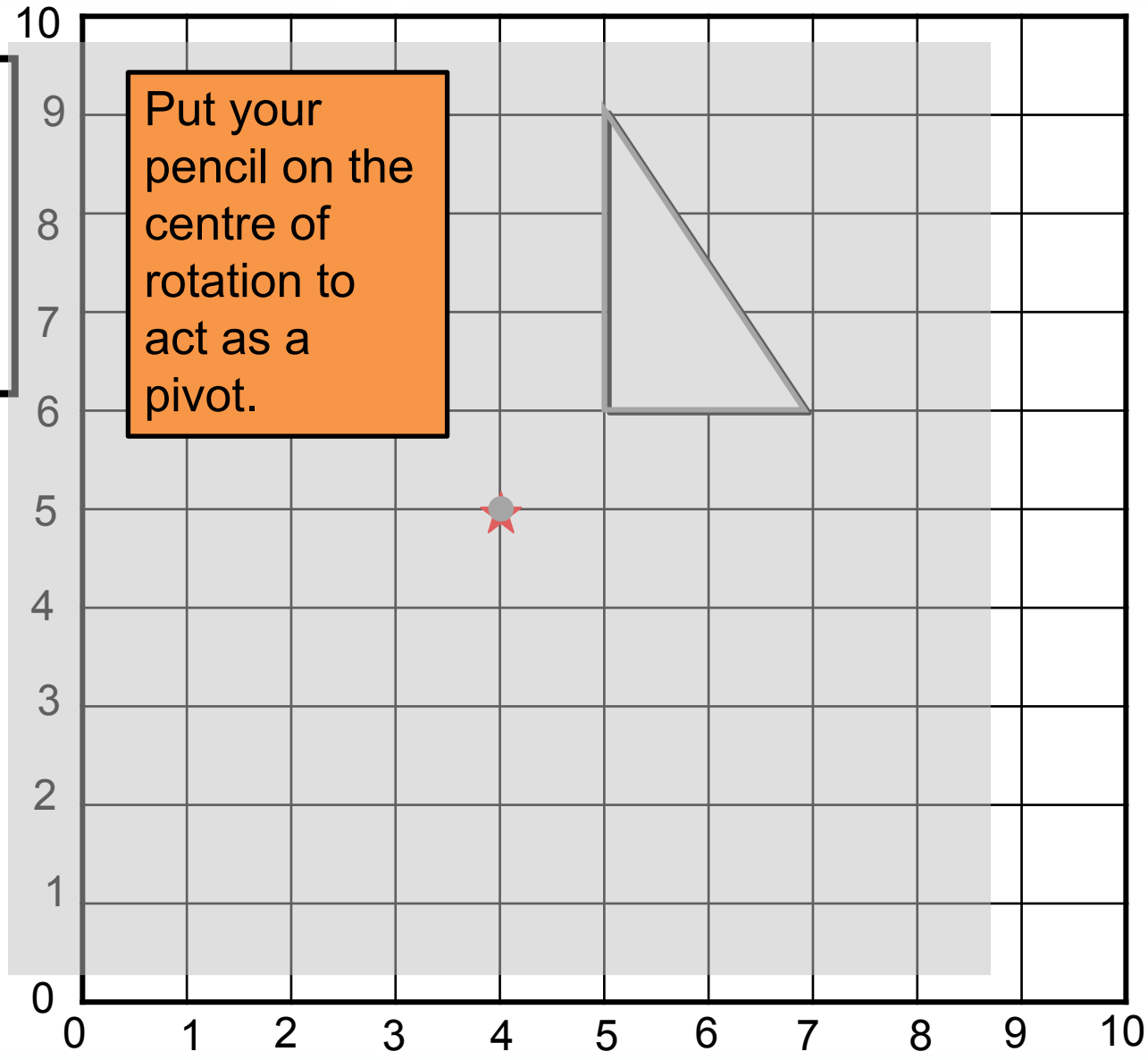
My Turn

LO: To identify draw and describe rotation around a center of rotation

Transform this triangle by the rotation:

90° clockwise around (4, 5)

Put your pencil on the centre of rotation to act as a pivot.



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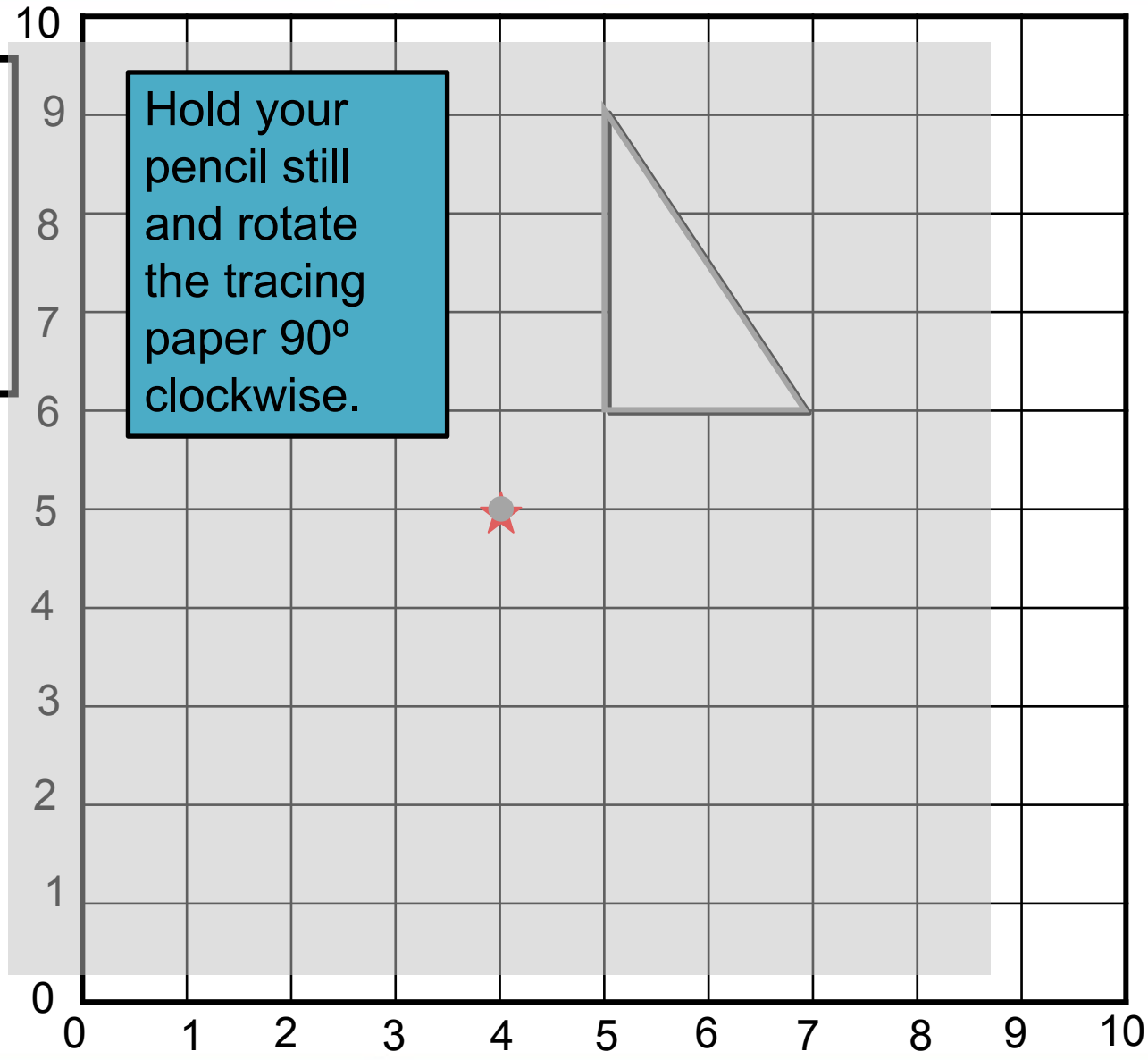
My Turn

LO: To identify draw and describe rotation around a center of rotation

Transform this triangle by the rotation:

90° clockwise around (4, 5)

Hold your pencil still and rotate the tracing paper 90º clockwise.



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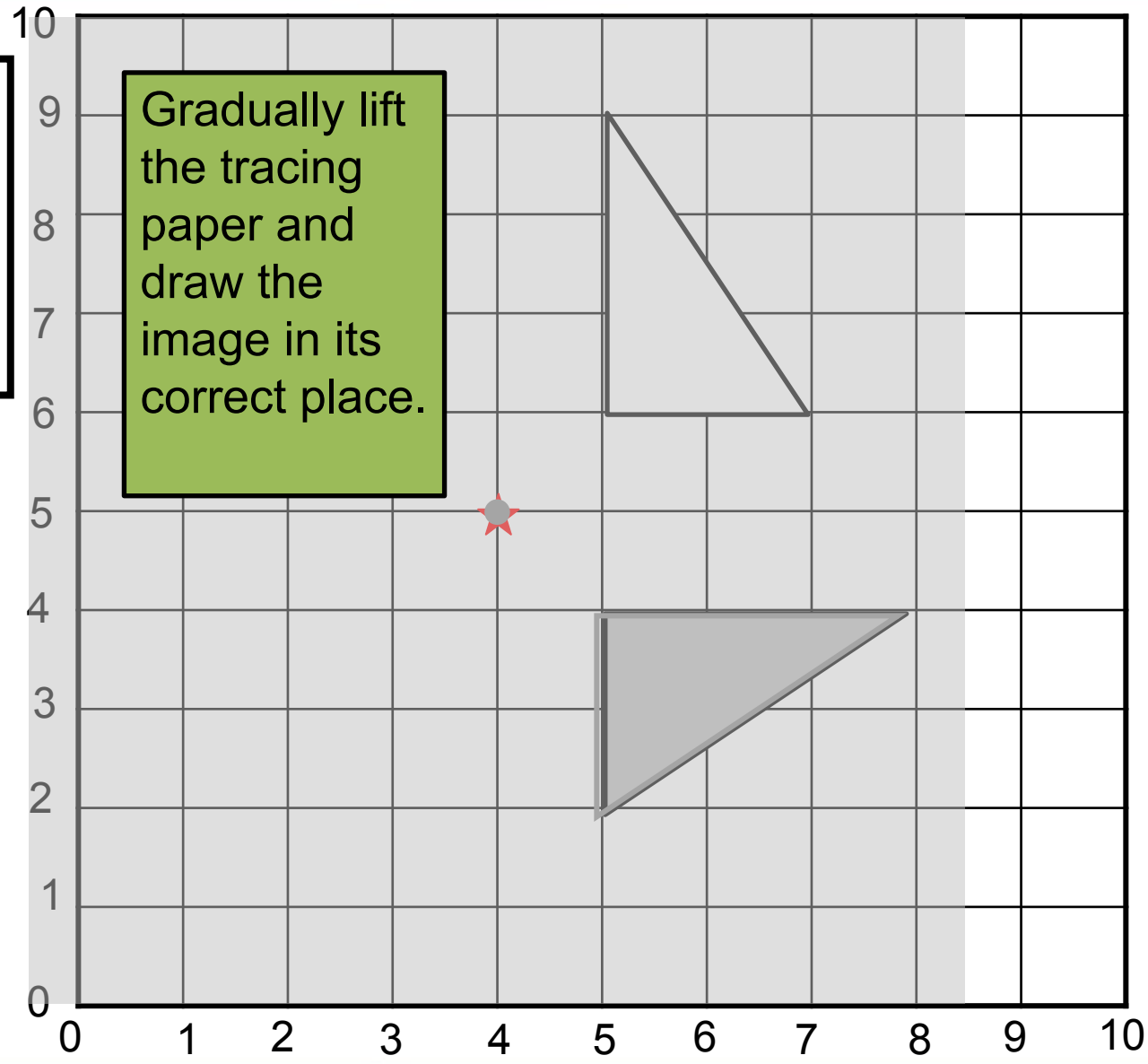
My Turn

LO: To identify draw and describe rotation around a center of rotation

Transform this triangle by the rotation:

90° clockwise around (4, 5)

Gradually lift the tracing paper and draw the image in its correct place.



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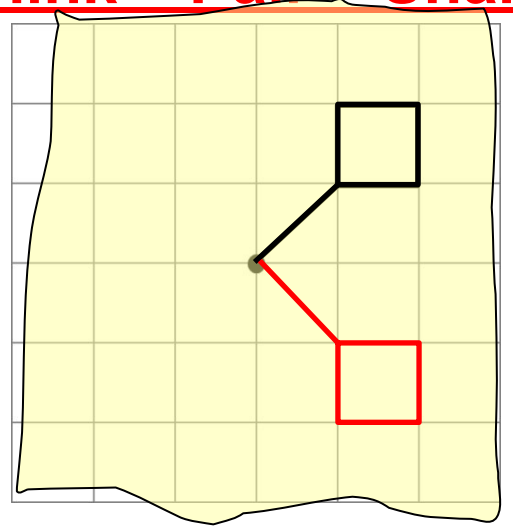
Mini-Plenary

LO: To identify draw and describe rotation around a center of rotation

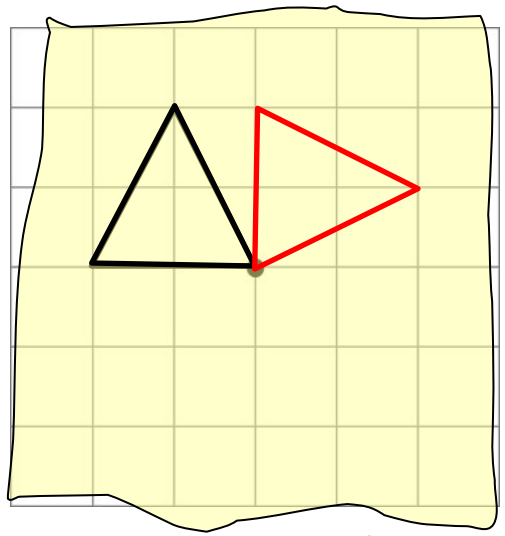
Think – Pair – Share

1)



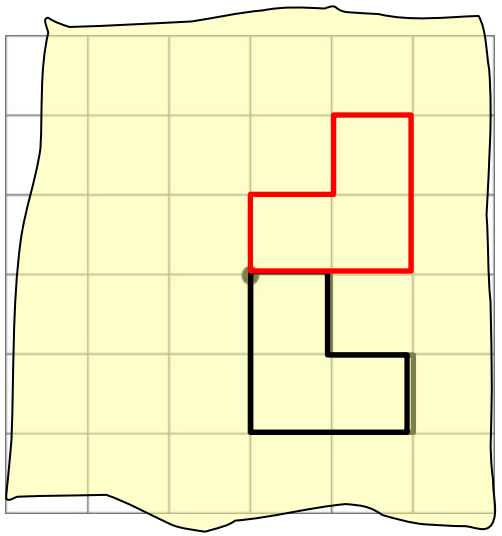
Rotate the shape 90° clockwise

2)



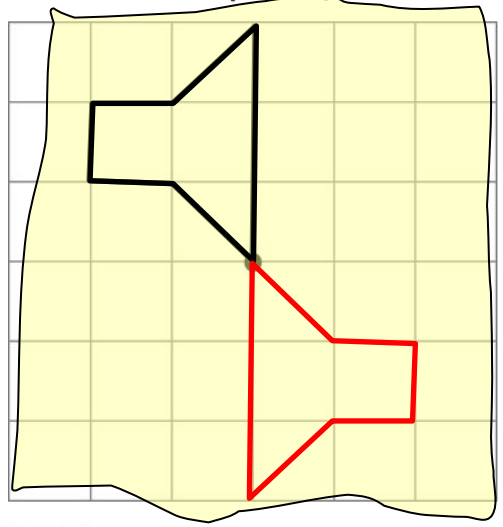
Rotate the shape 90° clockwise

3)



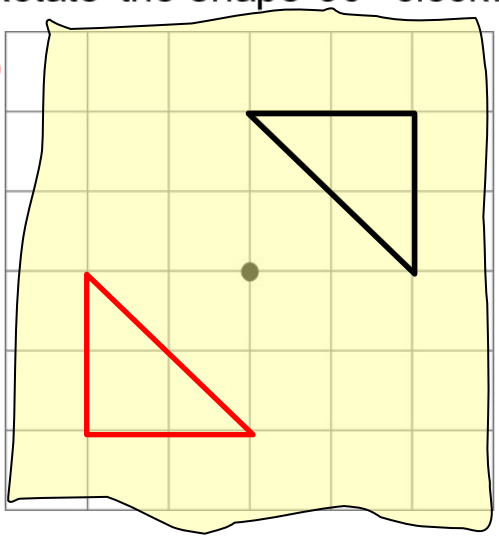
Rotate the shape 90° anti-clockwise

4)



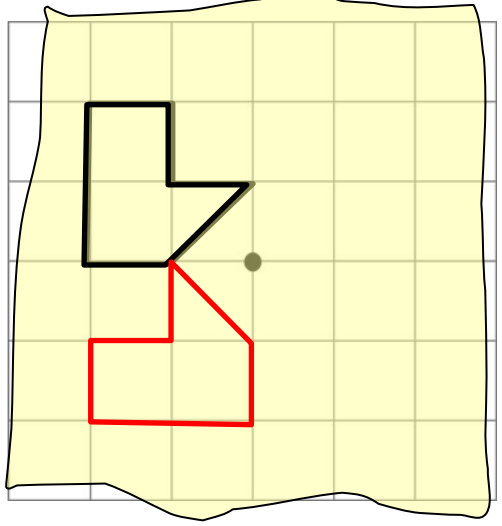
Rotate the shape 180° clockwise

5)



Rotate the shape 180° anti-clockwise

6)



Rotate the shape 270° clockwise

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Core Task

LO: To identify draw and describe rotation around a center of rotation

How **confident** do you feel with this topic?

Write red, amber or green in your book!

Complete the corresponding activity ☺

Extension: What word do the rotations make?

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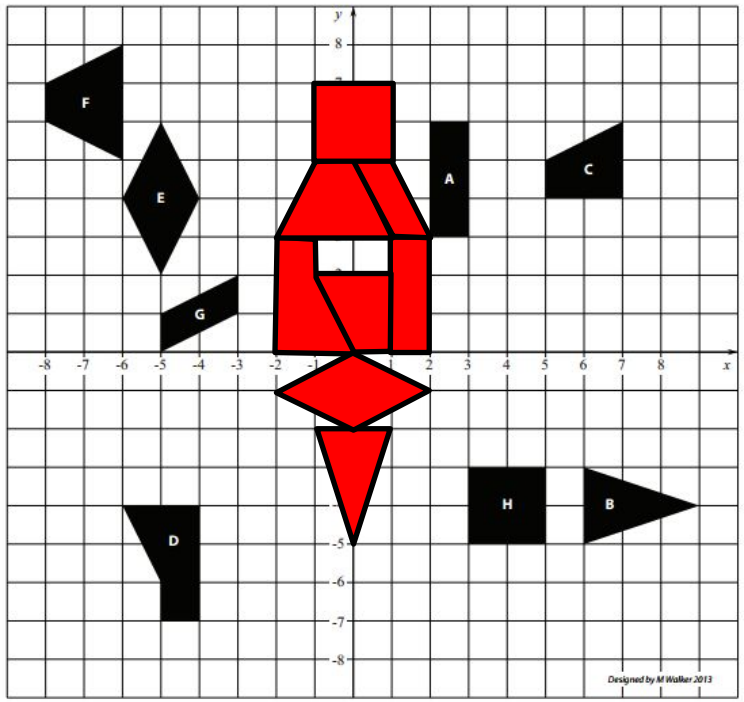
Rotation

LO: To identify draw and describe rotation around a center of rotation

Answers

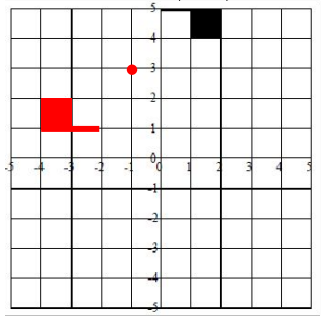


Ext) Rotate shape G 90° clockwise about the origin

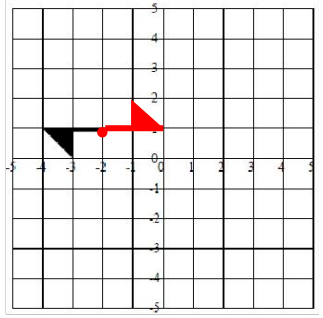
Ext) Translation shape A by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$

Ext) Reflect shape H in the line $x = 2$ and then $y = 1$ (or vice versa)

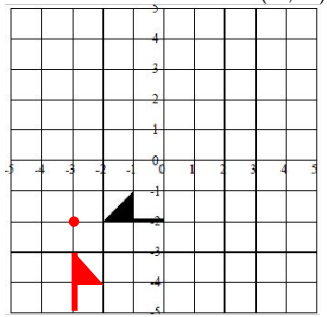
Rotate 180° from (-1, 3)



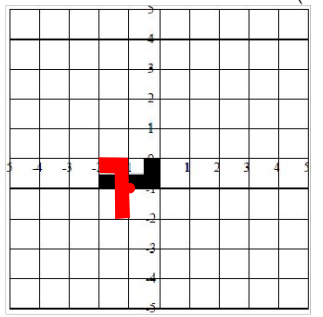
Rotate 180° from (-2, 1)



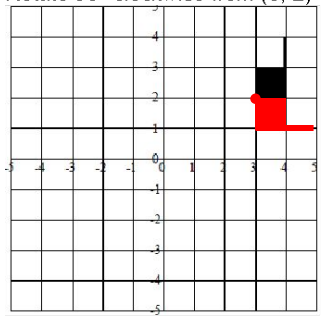
Rotate 90° clockwise from (-3, -2)



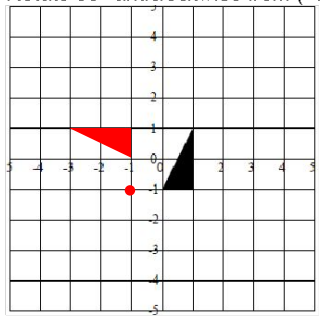
Rotate 90° anticlockwise from (-1, -1)



Rotate 90° clockwise from (3, 2)



Rotate 90° anticlockwise from (-1, -1)



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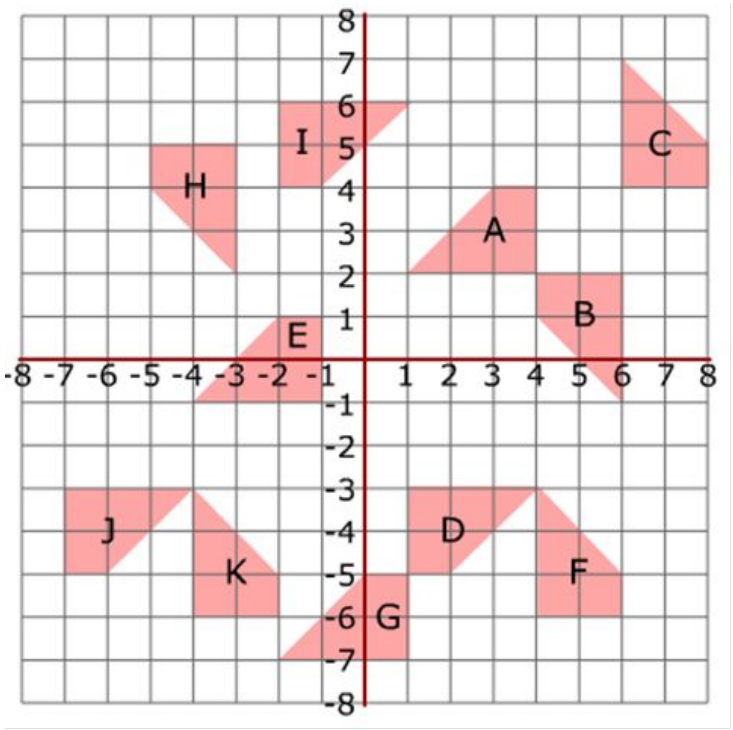
Extension

LO: To identify draw and describe rotation around a center of rotation

Task

Fully describe the transformations on the sheet.



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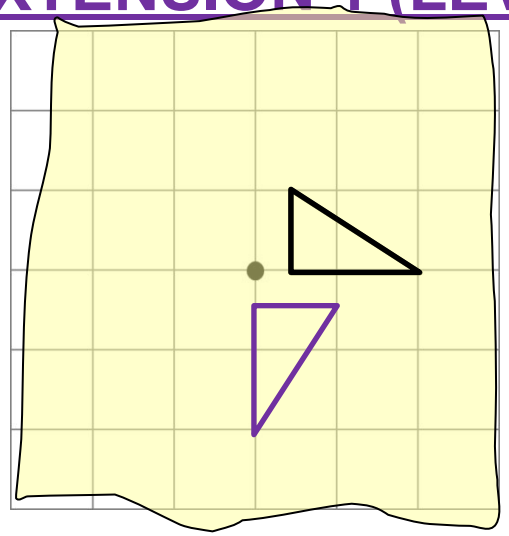
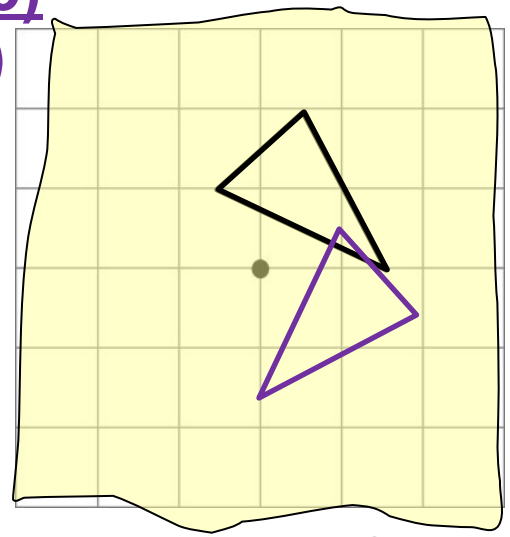
EXTENSION 1 (LEVEL 5)

1)



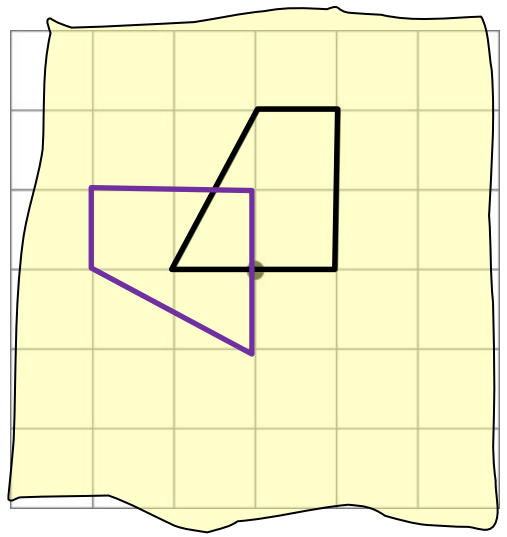
Rotate the shape 90° clockwise

2)

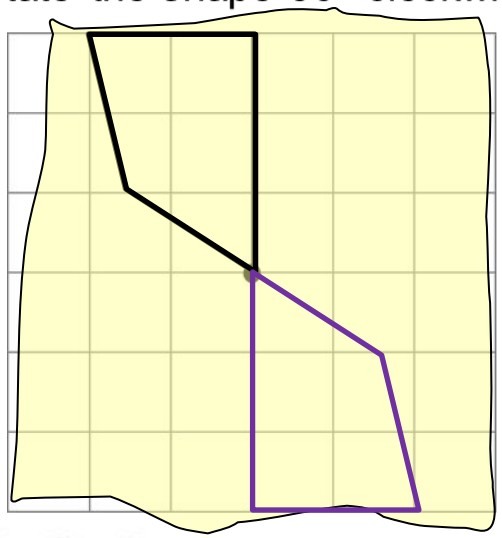


Rotate the shape 90° clockwise

3)

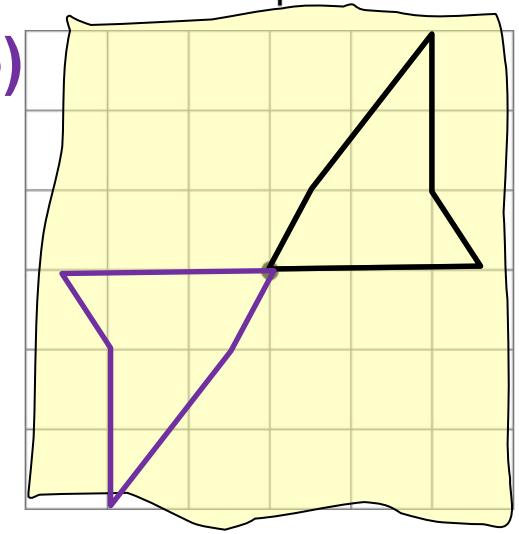


4)



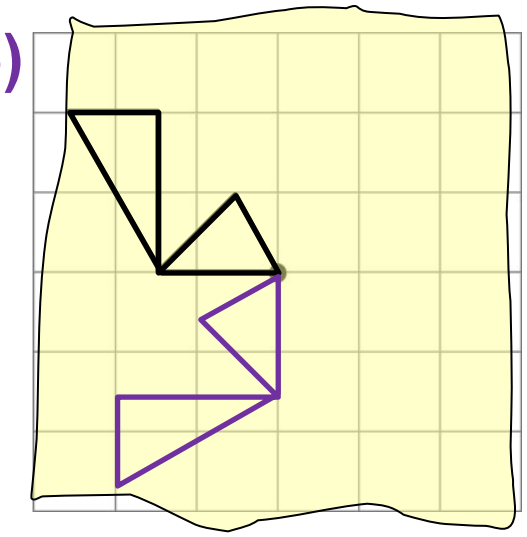
Rotate the shape 180° clockwise

5)



Rotate the shape 180° anti-clockwise

6)



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Answers

Rotation	90° or 180°	Clockwise or anticlockwise	Centre of rotation
A to B	90°	Anticlockwise	(6, 4)
B to C	180°	-	(6, 3)
C to D	90°	Clockwise	(0, 3)
D to E	180°	-	(0, -2)
E to F	90°	Clockwise	(-1, -6)
F to G	90°	Anticlockwise	(3, -8)
G to H	90°	Anticlockwise	(-7, 3)
H to I	90°	Anticlockwise	(-3, 6)
I to A	180°	-	(1, 4)

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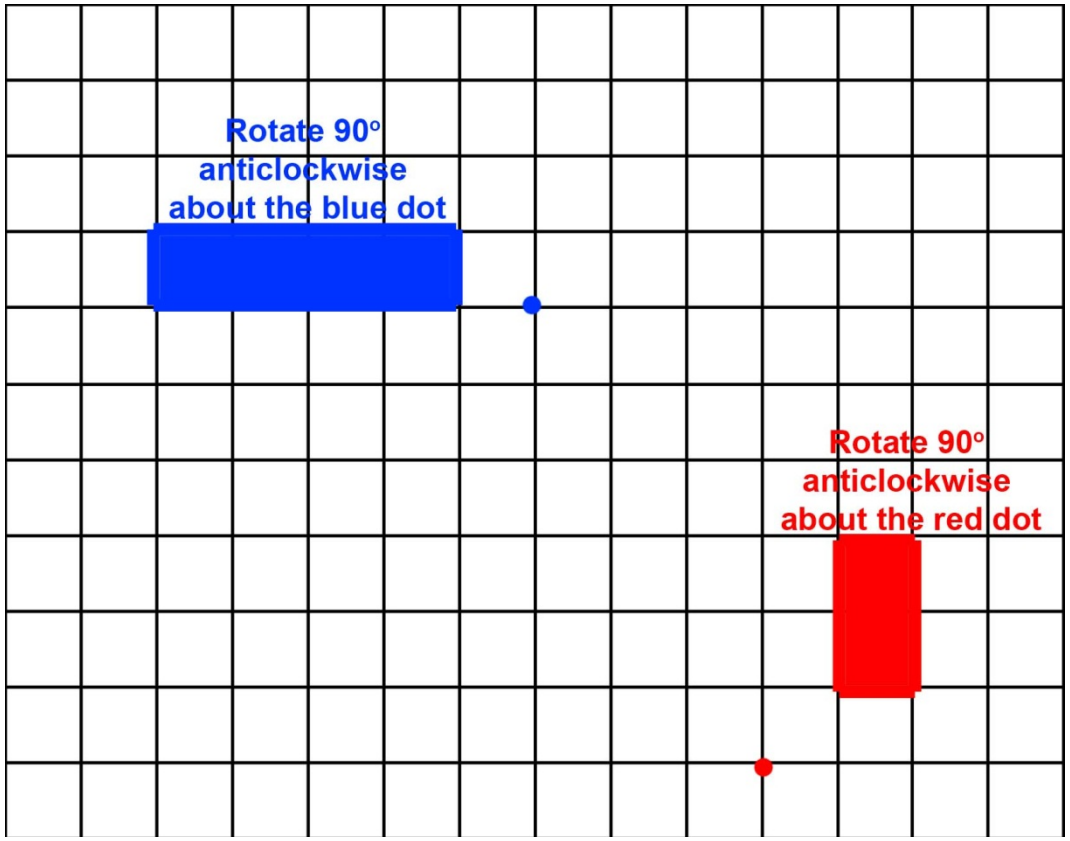
PLENARY

LO: To identify draw and describe rotation around a center of rotation

PLENARY ACTIVITY

Which letter would you get if you rotated each shape as described?



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Rotation

LO: To identify draw and describe rotation around a center of rotation

PLENARY ACTIVITY

Which letter would you get if you rotated each shape as described?