Curriculum Outcomes

(SS3) Demonstrate an understanding of similarity of polygons.

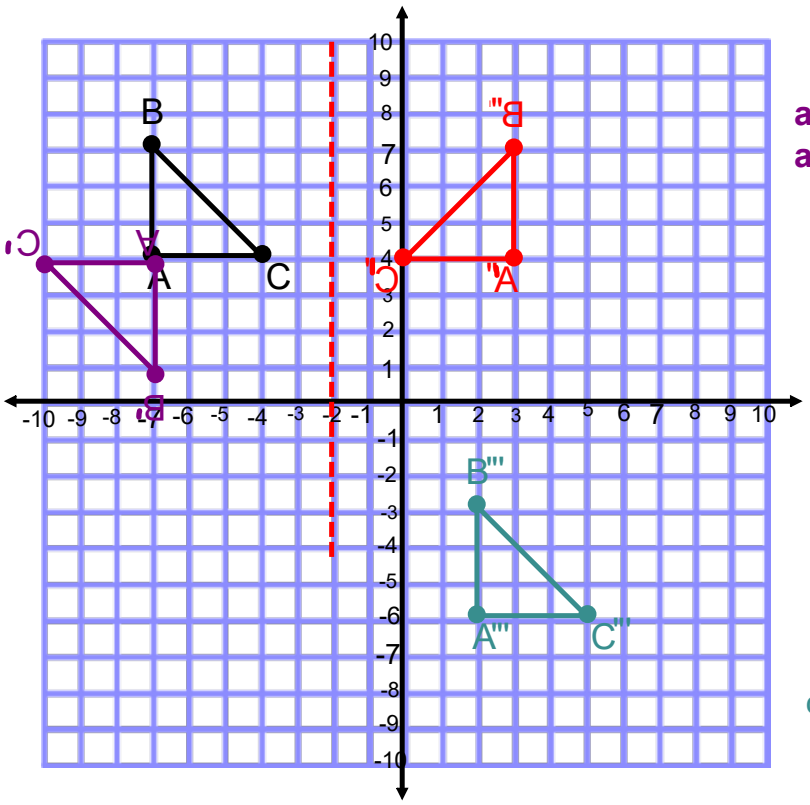
(SS4) Draw and interpret scale diagrams of 2-D shapes.

(SS5) Demonstrate an understanding of line and rotation symmetry.

Student Friendly: Identifying reflection, rotation and translations between given shapes

Warm Up

A(-7,4)
B(-7,7)
C(-4,4)



a) Rotate Triangle ABC 180° about A

A'(-7,4)
B'(-7,1)
C'(-10,4)

b) Reflect Triangle ABC about the line x = -2

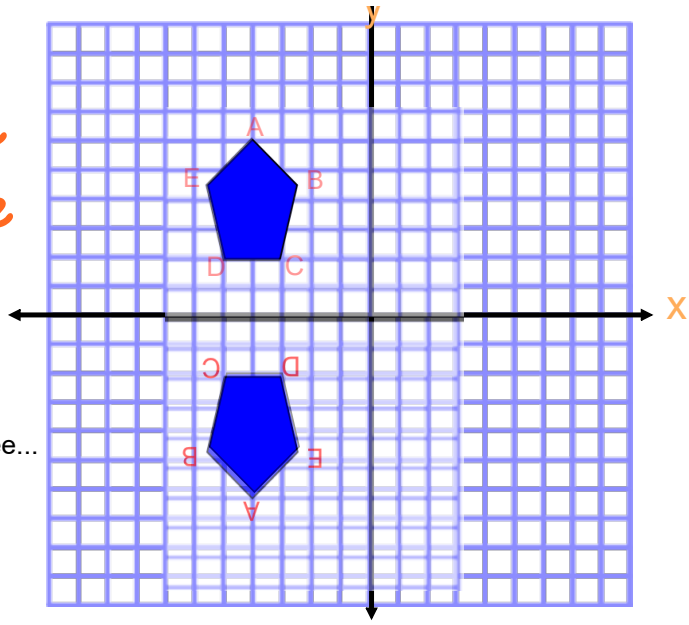
A''(3,4)
B''(3,7)
C''(0,4)

c) Translate Triangle ABC R9 D10

A'''(2,-3)
B'''(2,-3)
C'''(5,-6)

Section 7.7

Symmetry on the Cartesian Plane

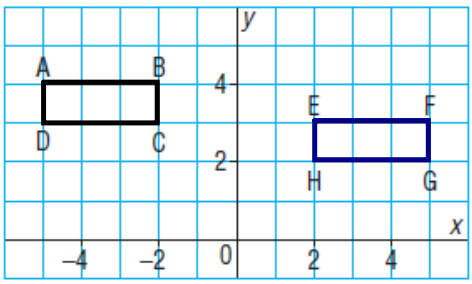


Describe any symmetry you can see...
be specific!!

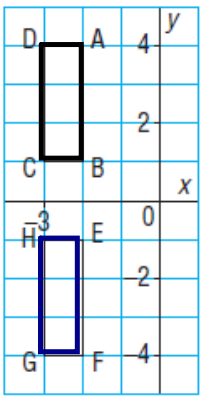
for a
Line of reflection
or
Rotation

For each pair of rectangles ABCD and EFGH, determine whether they are related by symmetry.

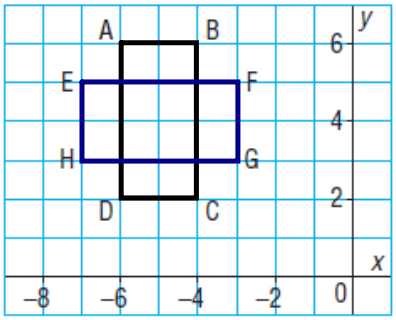
a)



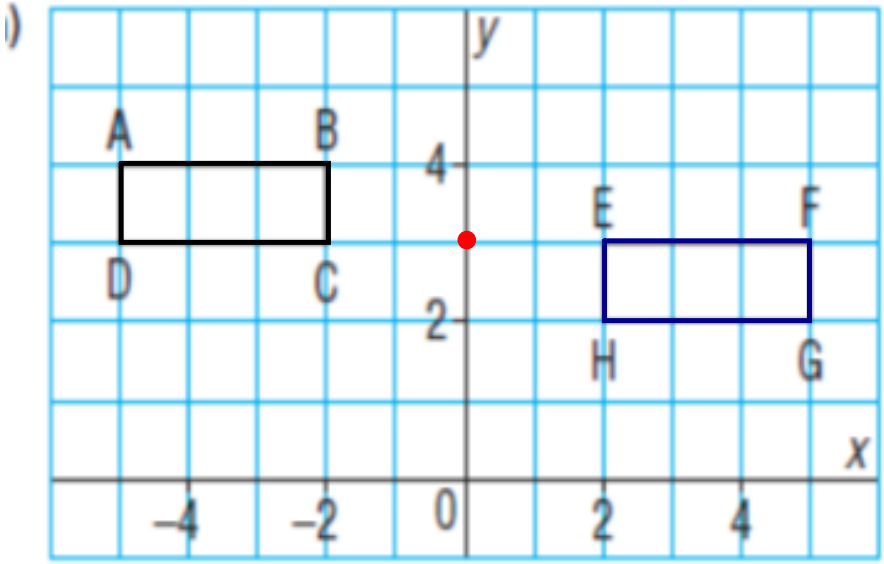
b)

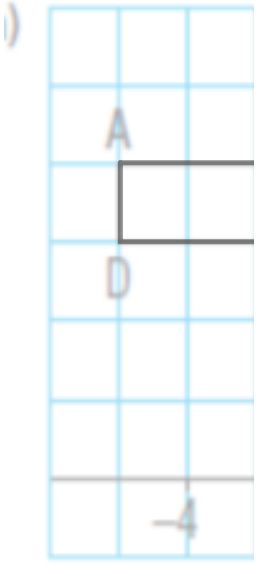


c)



Be specific when you describe the symmetry.

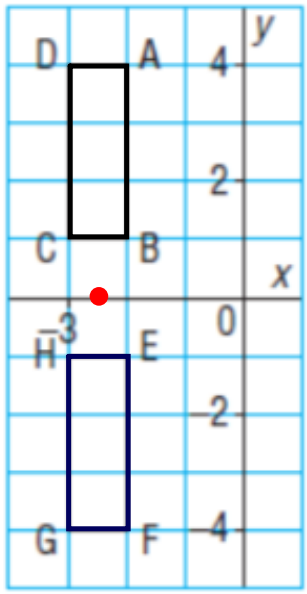




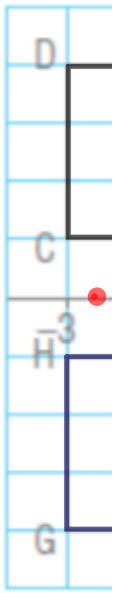
rotation of 180^0 about (0,3)

translation R7 D1

b)



b)

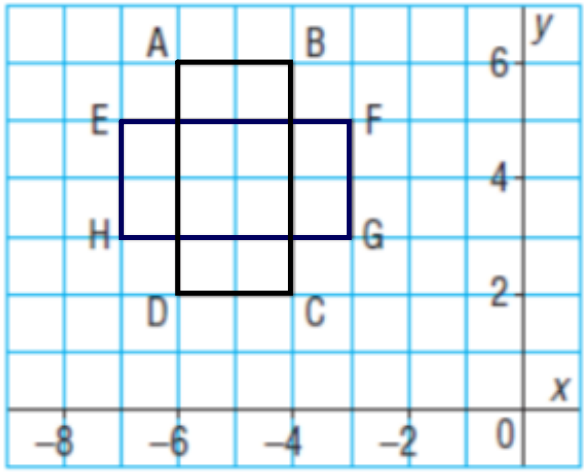


A reflection about the x axis

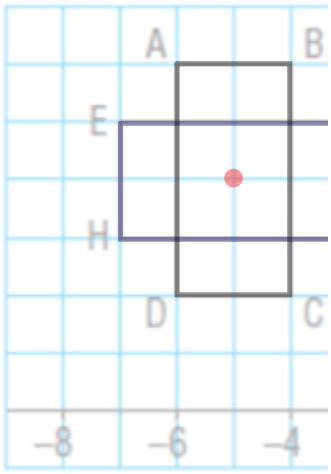
A rotation of 180° about point (-2.5,0)

A Translation D5

c)



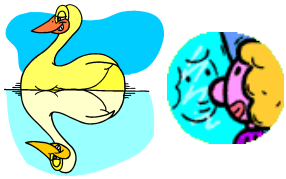
c)



Rotational angle of 90° about the point (-5, 4)

Rotational Symmetry of 4

Reflection



What do you need?

Translation

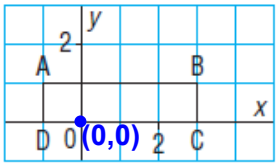
What do you need?

Rotation

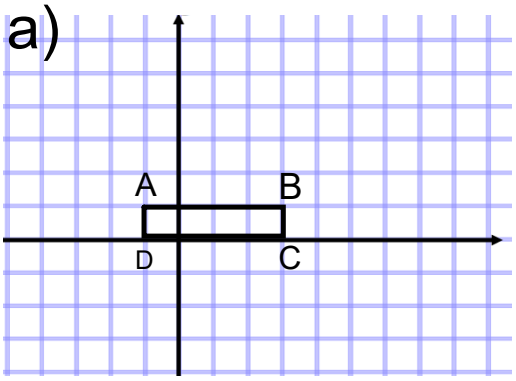
What do you need?

Draw the image of rectangle ABCD after each transformation.
Write the coordinates of each vertex and its image.
Identify and describe the type of symmetry that results.

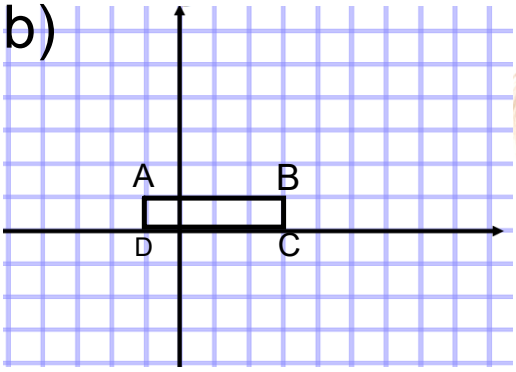
a) a rotation of 180° about the origin
b) a reflection in the x-axis
c) a translation 4 units right and 1 unit down



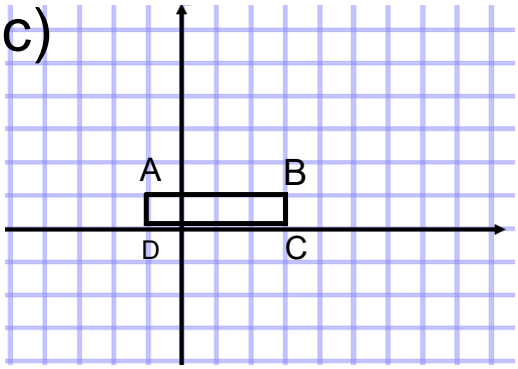
a)



b)

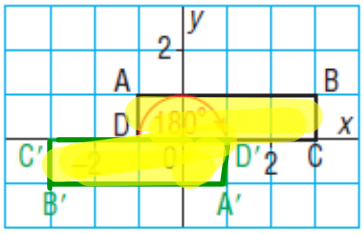


c)



a) Use tracing paper to rotate ABCD 180° about the origin.

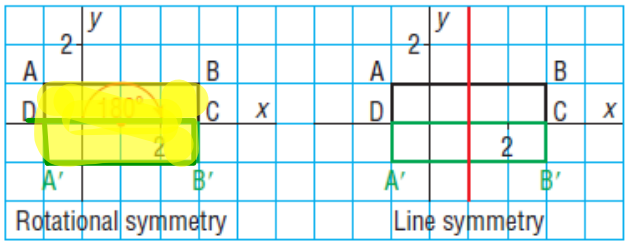
Point	Image
A(−1, 1)	A′(1, −1)
B(3, 1)	B′(−3, −1)
C(3, 0)	C′(−3, 0)
D(−1, 0)	D′(1, 0)



The octagon ABCD′A′B′C′D, formed by both rectangles together, has rotational symmetry of order 2 about the origin, and no line symmetry.

Reflect ABCD in the x-axis.

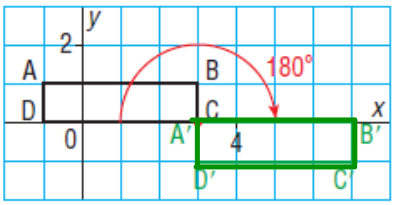
Point	Image
A(−1, 1)	A′(−1, −1)
B(3, 1)	B′(3, −1)
C(3, 0)	C(3, 0)
D(−1, 0)	D(−1, 0)



The rectangle ABB′A′, formed by both rectangles, has rotational symmetry of order 2 about the point (1, 0). It also has 2 lines of symmetry: the x-axis and the vertical line through 1 on the x-axis.

Translate ABCD 4 units right and 1 unit down.

Point	Image
A(−1, 1)	A′(3, 0)
B(3, 1)	B′(7, 0)
C(3, 0)	C′(7, −1)
D(−1, 0)	D′(3, −1)

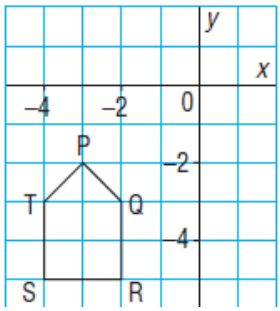


The two rectangles do not form a shape; but they have a common vertex at C (or A′).
The two rectangles are related by rotational symmetry of order 2 about the point C(3, 0).
There is no line of symmetry relating the rectangles.

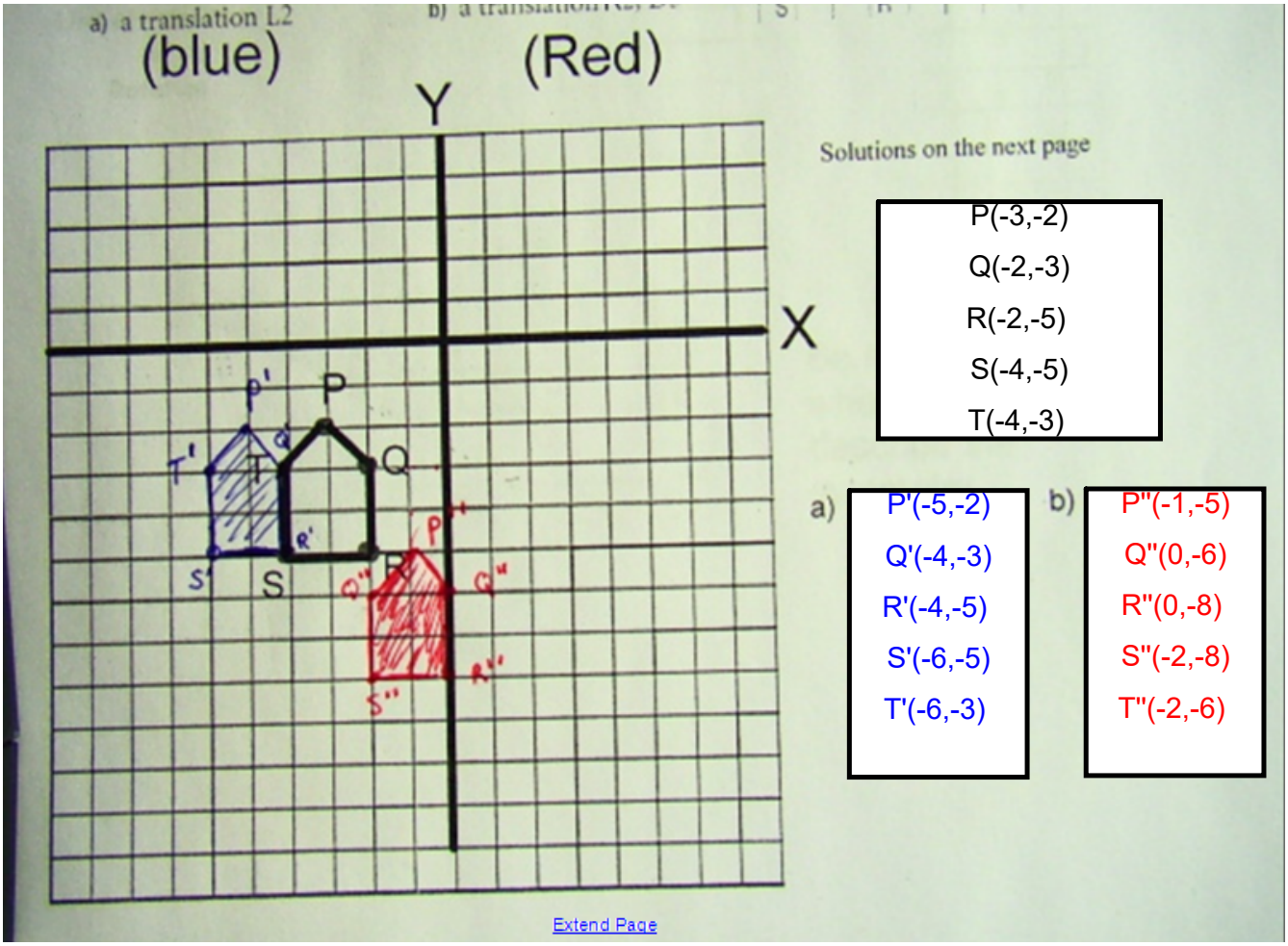
Draw the image of pentagon PQRST
after each translation below.
Label the vertices of the pentagon and its image,
and list their coordinates.
If each diagram has symmetry, describe it.
If each diagram does not have symmetry,
explain how you know.

a) a translation L2

b) a translation **R**2, D3



Solutions on the next page


a) a translation L2
(blue)
(Red)
Y
X
P'
P
Q'
Q
T'
T
R'
S'
S
Q''
R''
P''
Q''
R''
S''
Solutions on the next page
P(-3,-2)
Q(-2,-3)
R(-2,-5)
S(-4,-5)
T(-4,-3)
a)
P'(-5,-2)
Q'(-4,-3)
R'(-4,-5)
S'(-6,-5)
T'(-6,-3)
b)
P''(-1,-5)
Q''(0,-6)
R''(0,-8)
S''(-2,-8)
T''(-2,-6)
Extend Page

Class/Homework

Homework

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Questions 3,5,6,7,8,9,11,12