APRIL 15, 2019

UNIT 7: SIMILARITY AND TRANSFORMATIONS

7.5: REFLECTIONS AND LINE SYMMETRY

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MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

We will begin working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 5" OR "SS5" which states:

"Demonstrate an understanding of line and rotation symmetry."

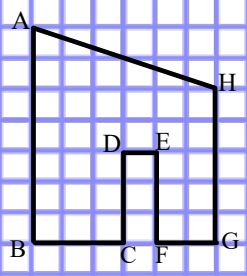
HOMEWORK QUESTIONS?

(pages 341 / 342, #4, 5, 9 & 13)

Activity

(Label your second polygon IJKLMNOP counterclockwise from the top left corner.)

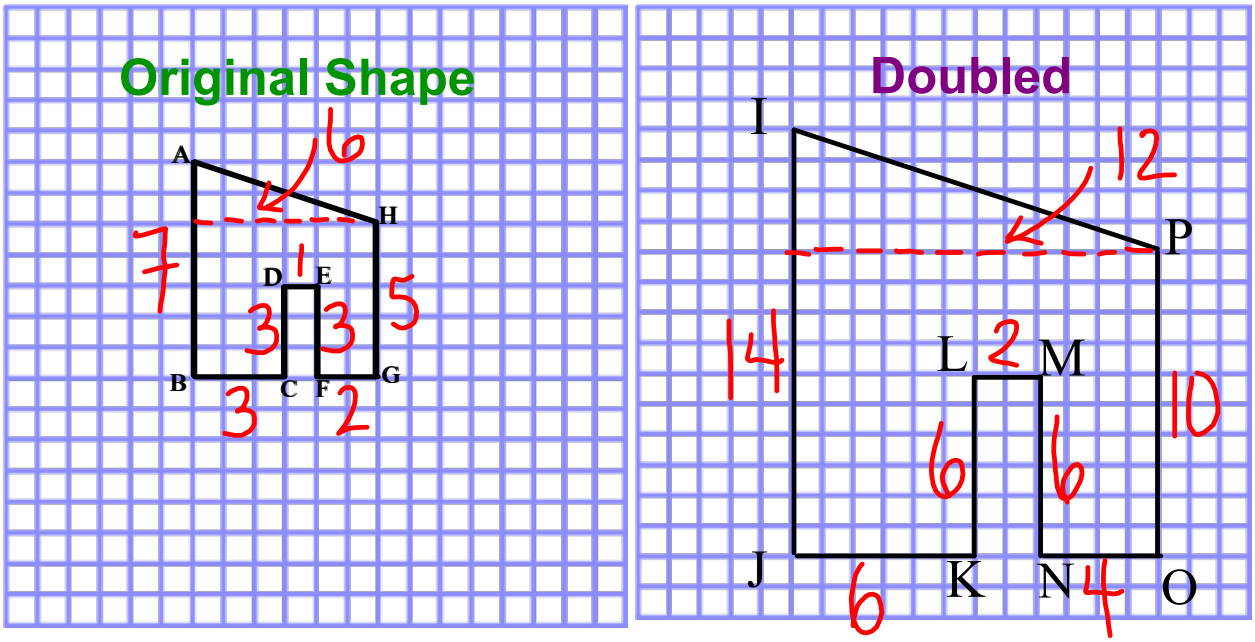
Original Shape



Doubled

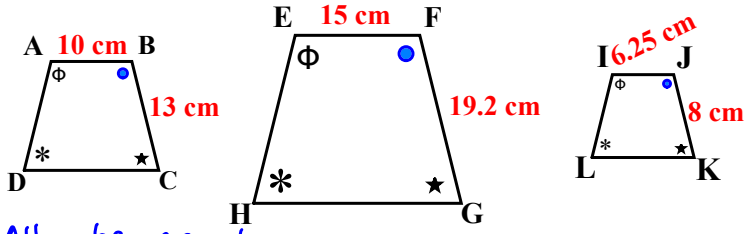
Activity

(Label your second polygon IJKLMNOP counterclockwise from the top left corner.)



WARM UP:

Which two trapezoids are similar? Show all work.



All angles are equal

ABCD ~ EFGH

$\frac{15}{10} = 1.5$

$\frac{19.2}{13} = 1.48$ X

ABCD ~ IJKL

$\frac{6.25}{10} = 0.625$

$\frac{8}{13} = 0.615$ X

EFGH ~ IJKL

$\frac{15}{6.25} = 2.4$ ✓

$\frac{19.2}{8} = 2.4$ ✓

Similar

<E = <I (Given)
<F = <J (Given)
<G = <K (Given)
<H = <L (Given)

AND

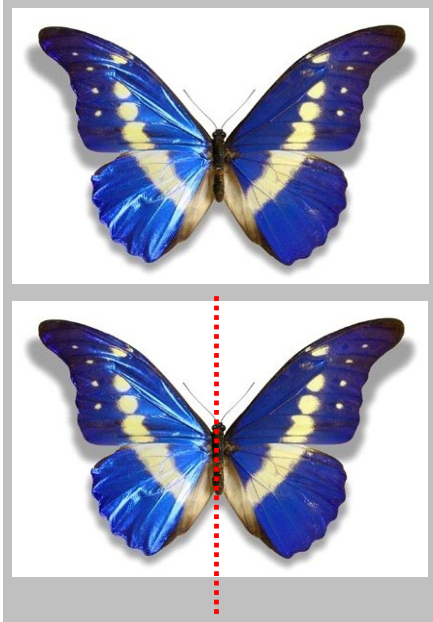
$\frac{EF}{IJ} = \frac{FG}{JK}$

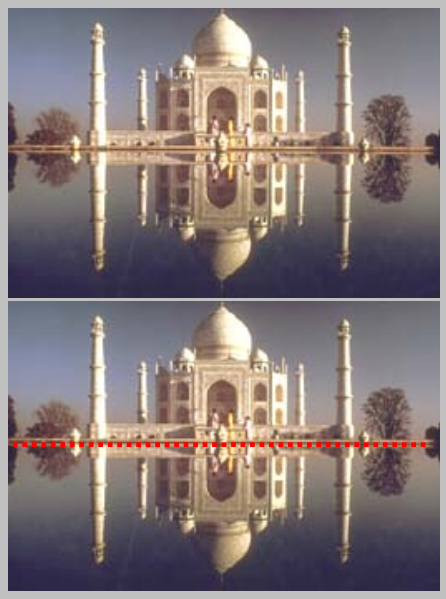
$\frac{15}{6.25} = \frac{19.2}{8}$

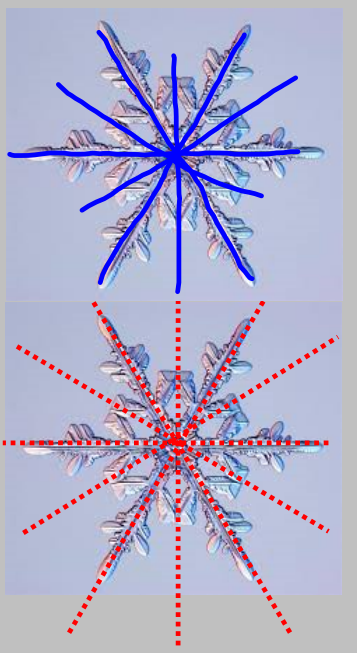
2.4 = 2.4

∴ trapezoid EFGH ~ trapezoid IJKL

A figure has symmetry when it can be folded so two halves match or are identical.

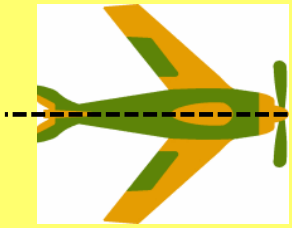




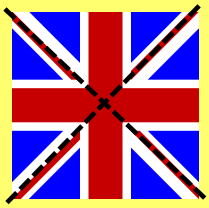


Shapes may show symmetry when folded:

vertically

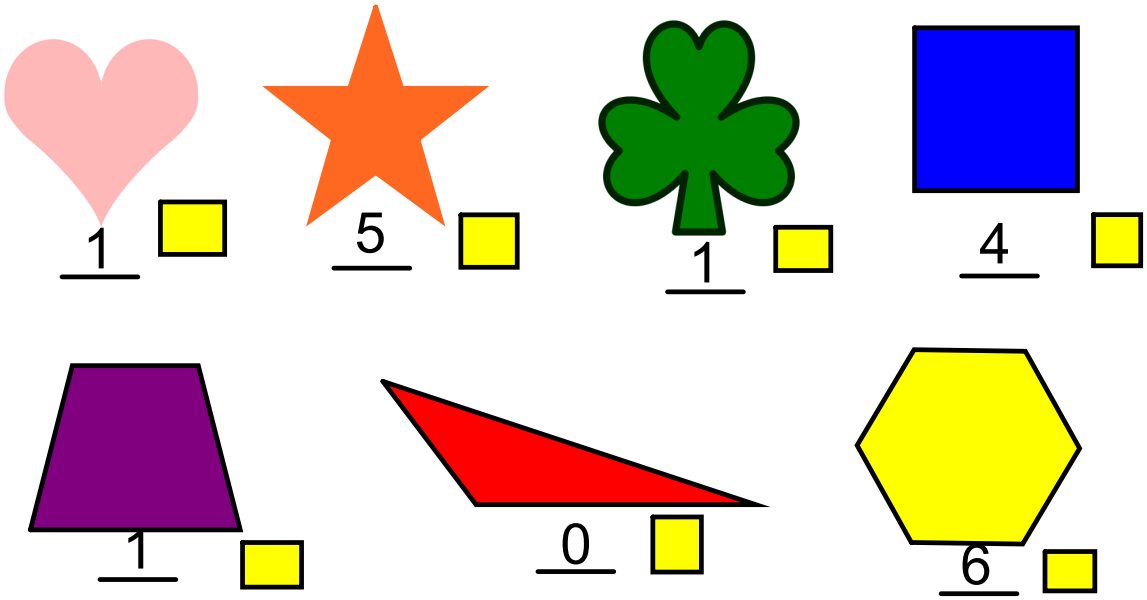


horizontally

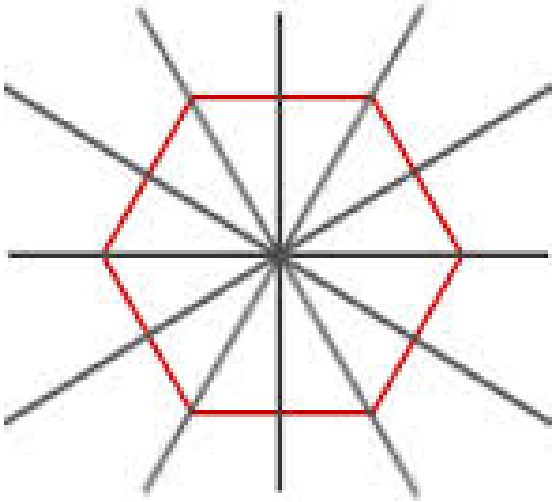


diagonally

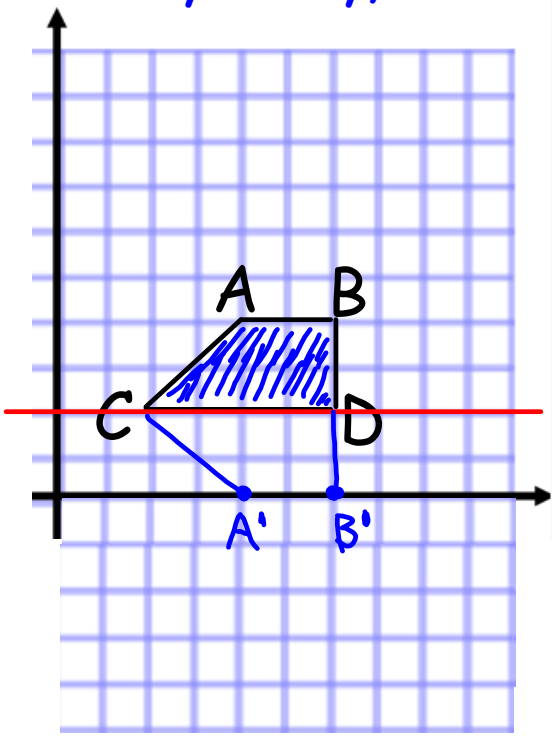
How many lines of symmetry are in the following figures?



The 6 lines of symmetry in a regular hexagon:



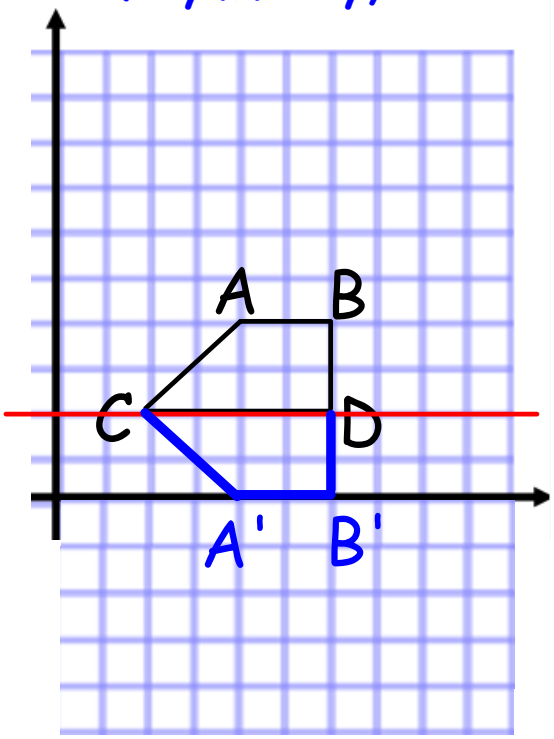
Copy the shape on graph paper. Use the red line as a line of symmetry, and complete the other half.



Coordinates:

A (4 , 4)
B (6 , 4)
C (2 , 2)
D (6 , 2)
A' (4 , 0)
B' (6 , 0)

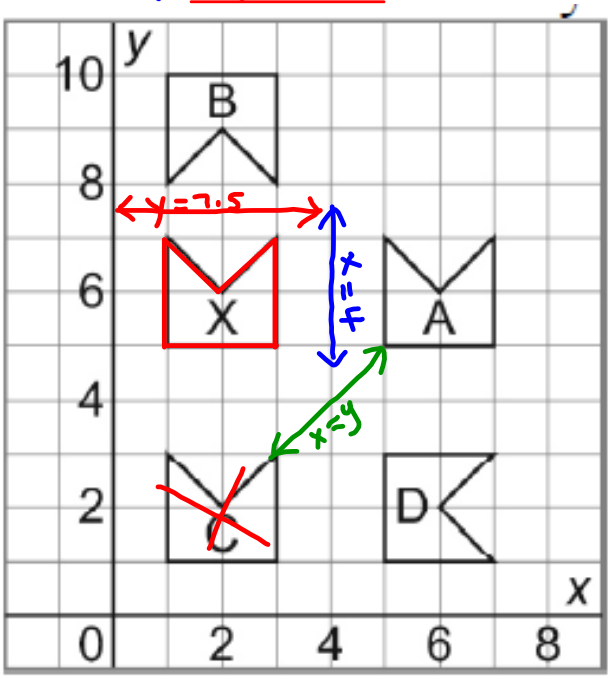
Copy the shape on graph paper. Use the red line as a line of symmetry, and complete the other half.



Coordinates:

A (4 , 4)
B (6 , 4)
C (2 , 2)
D (6 , 2)
A' (4 , 0)
B' (6 , 0)

Identify the images that are related to the shape "X" by a line of reflection. Describe the symmetry in each case.



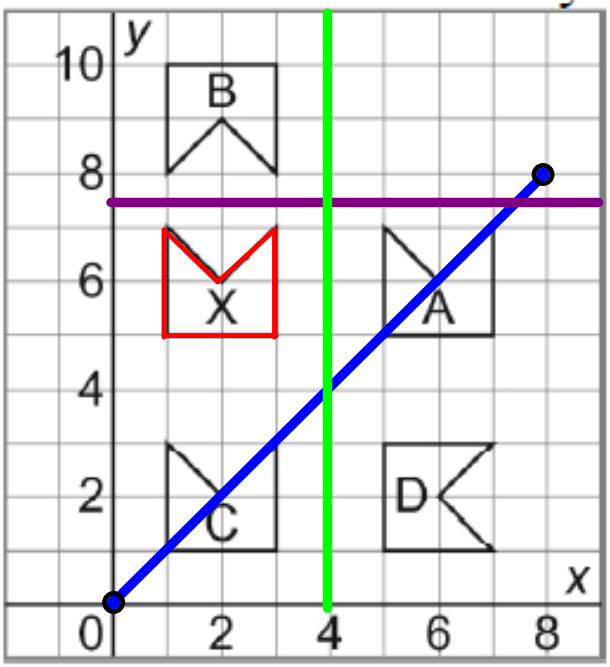
A: the reflection image in the vertical line through 4 on the x-axis

B: the reflection image in the horizontal line through 7.5 on the y-axis

C: not related to "X" by line symmetry

D: the reflection image in the oblique line through (0, 0) and (8, 8)

Identify the images that are related to the shape "X" by a line of reflection. Describe the symmetry in each case.



A: the reflection image in the vertical line through 4 on the x-axis

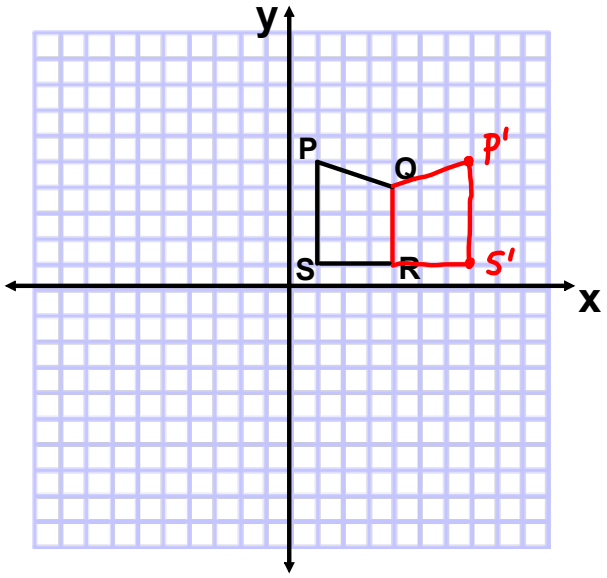
B: the reflection image in the horizontal line through 7.5 on the y-axis

C: not related to "X" by line symmetry

D: the reflection image in the oblique line through (0, 0) and (8, 8)

Quadrilateral PQRS is part of a larger shape.

a) Draw its reflection in the vertical line through 4 on the x-axis.



Coordinates:

P	(1 , 5)
Q	(4 , 4)
R	(4 , 1)
S	(1 , 1)

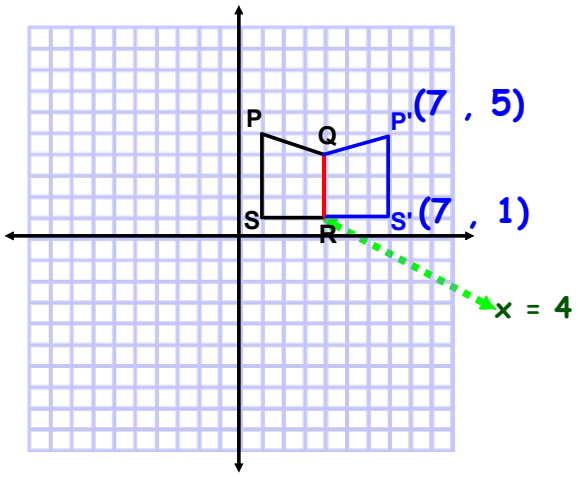
b) Write the coordinates of the vertices of the larger shape. P(1,5) Q(4,4) P'(7,5) S'(7,1) S(1,1)

c) Describe the larger shape and its symmetry.

Pentagon Line of Symmetry x=4

Quadrilateral PQRS is part of a larger shape.

a) Draw a reflection in the vertical line through 4 on the x-axis.



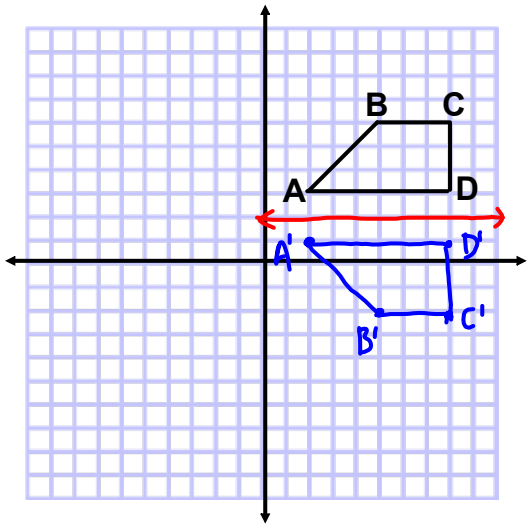
b) Write the coordinates of the vertices of the larger shape.

P (1 , 5) ; Q (4 , 4) ; P' (7 , 5) ; S (1 ,1) ; and S' (7 , 1)

c) Describe the larger shape and its symmetry.

It is a pentagon (P Q P' S' S) with a line of symmetry through QR.

a) Draw a reflection of quadrilateral ABCD in the horizontal line through 2 on the y-axis.



Coordinates:

A	(2 , 3)
B	(5 , 6)
C	(8 , 6)
D	(8 , 3)
A'	(2, 1)
B'	(5, -2)
C'	(8, -2)
D'	(8, 1)

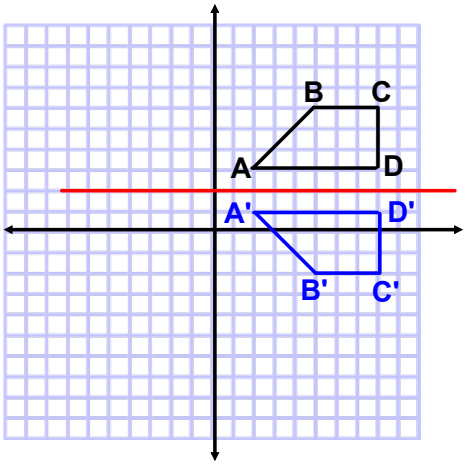
b) Write the coordinates of the image of ABCD.

See above.

c) Describe the image of ABCD.

Quadrilateral

a) Draw a reflection of quadrilateral ABCD in the horizontal line through 2 on the y-axis.



Coordinates:

A	(2 , 3)
B	(5 , 6)
C	(8 , 6)
D	(8 , 3)
A'	(2 , 1)
B'	(5 , -2)
C'	(8 , -2)
D'	(8 , 1)

b) Write the coordinates of the image of ABCD.

(See above.)

c) Describe the image of ABCD.

The image of ABCD is a still a quadrilateral (A'B'C'D').

CONCEPT REINFORCEMENT:

MMS9:

PAGE 342: #13

PAGE 352: #5(a)

PAGE 357: #3

PAGE 358: #5

PAGE 359: #8, #9 & #10