Section 10.5 - Transformations and 3D Geometry

Name: _____ Class: _____

Video Notes

Transformations

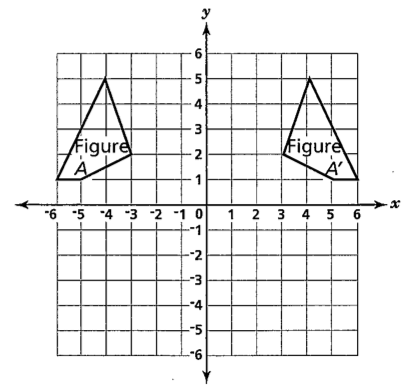| Reflections	Translations	Dilations	Rotations

Examples

Example 1	Example 2
Describe a sequence of transformations that maps triangle C to triangle D.	Describe a sequence of transformations that maps triangle E to triangle G.

3D Geometry – Volume

| Cyllinder	Cone	Sphere
$V = \pi r^2 h$	$V = \dfrac{1}{3}\pi r^2 h$	$V = \dfrac{4}{3}\pi r^3$

1.) Figure A and its image after a transformation, Figure A', are shown in the coordinate plane below. The two figures are congruent. How was Figure A transformed to create the congruent Figure B?

(A) It was reflected over the x-axis.

(B) It was reflected over the y-axis.

(C) It was translated 9 units to the right.

(D) It was rotated 90° clockwise around the origin.

2.) The two triangles shown are similar. Which series of transformations could have been used to transform triangle ABC to similar triangle A'B'C'?
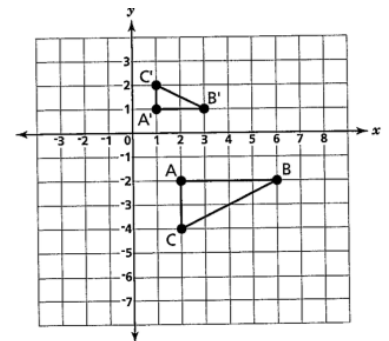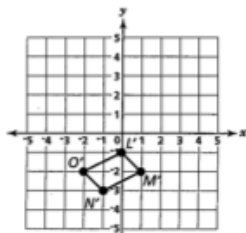
(A) a dilation about the origin with a scale factor of 0.25 and a reflection across the y-axis.

(B) a dilation about the origin with a scale factor of 0.5 and a reflection across the y-axis.

(C) a dilation about the origin with a scale factor of 0.25 and a reflection across the x-axis.

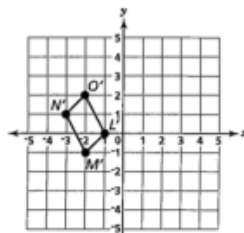(D) a dilation about the origin with a scale factor of 0.5 and a reflection across the x-axis.
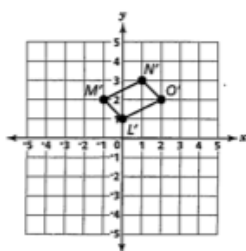
3.) Parallelogram LMNO is shown below.
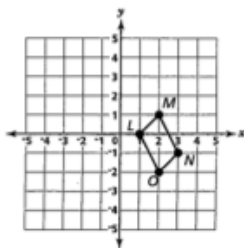
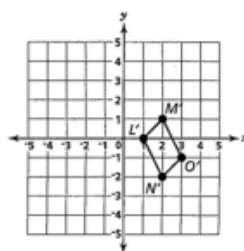Which figure represents parallelogram LMNO rotated 90° counterclockwise around the origin?

A

C

B

D

Go On

4.) Which sequence of transformations on Figure A will generate the similar images, figure A', as shown on the coordinate plane below?

(A) Dilate Figure A by a scale factor of 2 and with a center of dilation at the origin, and reflect it across the y-axis.

(B) Dilate Figure A by a scale factor of 2 and with a center of dilation at the origin, and reflect it across the x-axis.

(C) Dilate Figure A by a scale factor of 4 and with a center of dilation at the origin, and rotate it 90° clockwise around the origin.

(D) Dilate Figure A by a scale factor of 4 and with a center of dilation at the origin, and rotate it 180° clockwise around the origin.
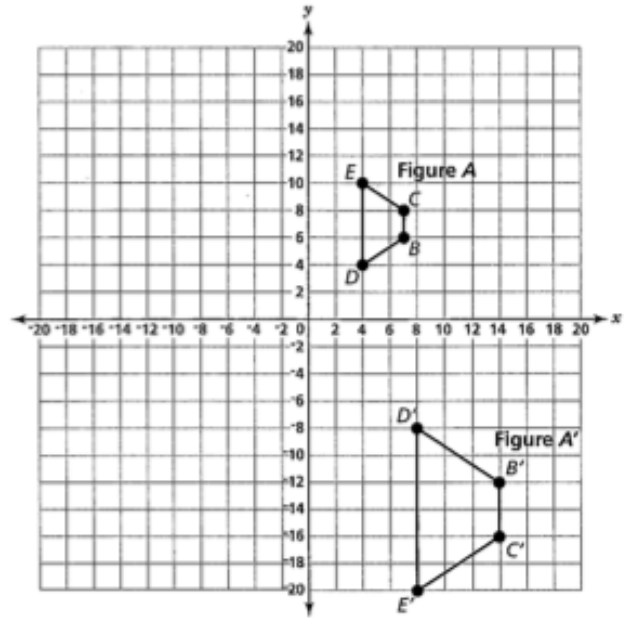
5.) Which sequence of transformations was used to create quadrilateral A'B'C'D'?

(A) Quadrilateral ABCD was rotated 90° counterclockwise about the origin and then translated 4 units down.

(B) Quadrilateral ABCD was rotated 270° counterclockwise about the origin and then translated 4 units left.

(C) Quadrilateral ABCD was reflected across the x-axis and then rotated 270° counterclockwise about the origin.

(D) Quadrilateral ABCD was reflected across the x-axis and then rotated 90° counterclockwise about the origin.
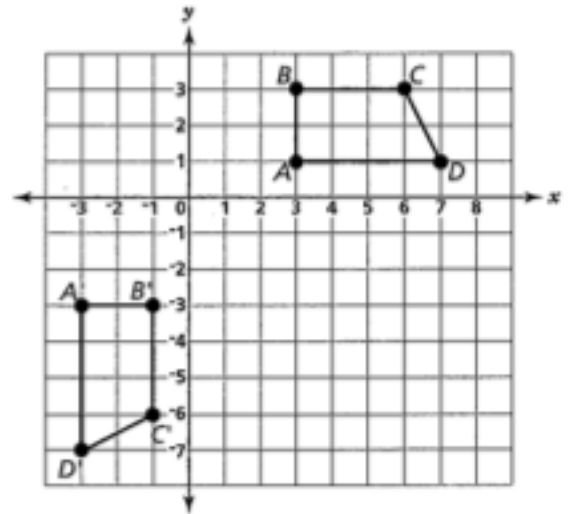
6.) A water tank is in the shape of a circular cylinder with a height of 10 feet and a volume of 90π cubic feet. What is the diameter, in feet, of the water tank?

(A) 9   (B) 5   (C) 3   (D) 6

7.) In the coordinate plane below, Figure D' is similar to Figure D. Which two transformations were performed on figure D resulting in figure D'?

(A) A reflection over the x-axis and dilation by a scale factor of ½

(B) A reflection over the x-axis and dilation by a scale factor of 1/3

(C) A dilation with a scale factor of ½ and a reflection over the y-axis

(D) A dilation with a scale factor of 1/3 and a reflection over the y-axis
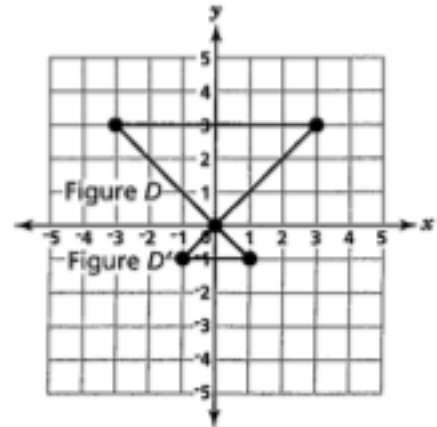
8.) Look at figure PQRS. If figure PQRS is dilated using a scale factor of 0.5 with the center of dilation at (0,0), what are the coordinates of the points of the image P'Q'R'S'?

(A) P'(1.5,1.5), Q'(2.5,1.5), R'(2.5,3.5), S'(0.5,3.5)

(B) P'(2.5,2.5), Q'(6.5,4.5), R'(6.5, 8.5), S'(2.5,8.5)

(C) P'(4,4), Q'(12,8), R'(12,16), S'(4,16)

(D) P'(1,1), Q'(3,2), R'(3,4), S'(1,4)
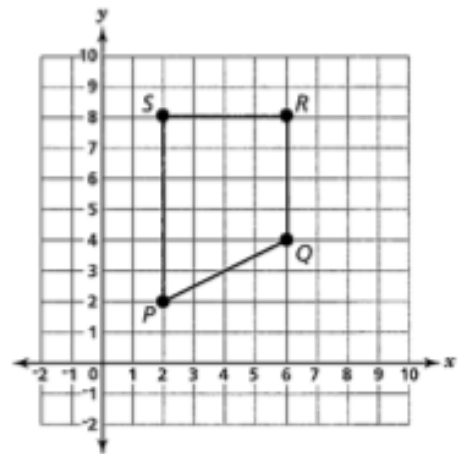
9.) Triangle ABC was rotated 90° clockwise. Then it underwent a dilation centered at the origin with a scale factor of 4. Triangle A"B"C" is the resulting image.

a.) What parts of ΔA"B"C" are congruent to the corresponding parts of the original triangle? Explain your reasoning. **(3 points)**

b.) Compare the perimeters of ΔABC and ΔA"B"C". Explain your reasoning. **(3 points)**

10.) If Brandon drew two figures on the coordinate grid shown below, which transformation did Brandon apply to Figure A to get Figure B?
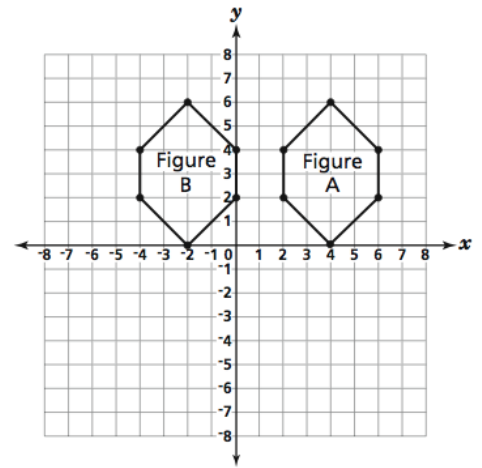
(A) rotated 90°

(B) dilated by 6

(C) reflected in the y-axis

(D) translated 6 units to the left

11.) Figure Q was the result of a sequence of transformations on figure P, both shown below. Which sequence of transformations could take figure P to figure Q?
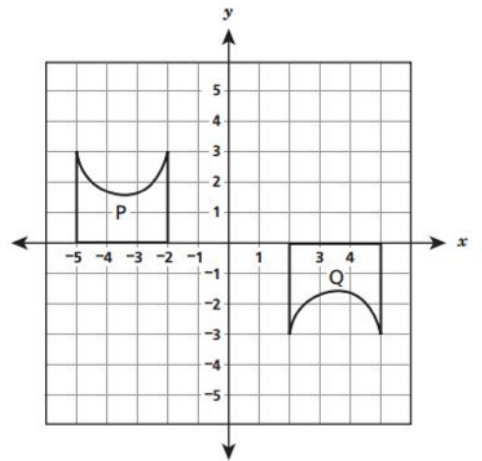
(A) reflection over the x-axis and translation 7 units right

(B) reflection over the y-axis and translation 3 units down

(C) translation 1 unit right and 180° rotation about the origin

(D) translation 4 units right and 180° rotation about the origin

12.) The circle shown below is centered at (0,0) and passes through point P located at (2,0). The circle is dilated with the center of dilation at the origin and a scale factor 0.5 and then translated up 3 units. What are the coordinates of the image of point P after this transformation?
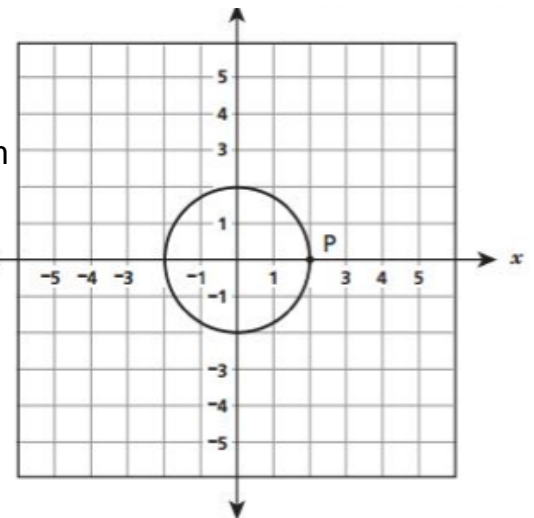
(A) (4,3)

(B) (1,3)

(C) (1,1.5)

(D) (0.5,3)

13.) Rectangle R undergoes a dilation with scale factor ¼ and then a reflection over the y-axis. The resulting image is Rectangle S. Which statement about Rectangles R and S is true?

(A) They are congruent and similar.

(B) They are similar but not congruent.

(C) They are congruent but not similar.

(D) They are neither congruent nor similar.

14.) Find the **exact** volume of a cylinder that has a radius of 7 and a height of 10.

15.) Find the volume of a cone that has a diameter of 10 inches and a height of 13 inches. Round to the nearest hundredth.

16.) Find the volume of a sphere that has a diameter of 22 cm. Round to the nearest whole number.

17.) A box contains 9 identical glass spheres that are used to make snow globes. The spheres are tightly packed, as shown below. What is the total volume, in cubic inches, of all 9 spheres? Round your answer to the nearest tenth of a cubic inch.

12 in.

12 in.