Warm-up

Translations

Using arrow notation to write a rule.

Example:

1) Write a rule that would move a point 3 units to the right and 5 units down.

(x, y) ⟶

2) Write a rule that would move a point 6 units down.

(x, y) ⟶

3) Write a rule that would move a point 8 units to the left.

(x, y) ⟶

Reflections

Give the coordinates of the image of each point after a reflection in axis indicated.

4) (5, 7) ; x-axis

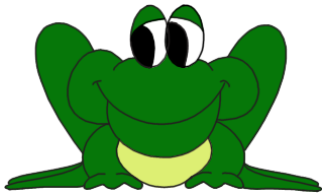
5) (3, 4) ; y-axis

6) (-8, -2) ; x-axis

7) (-5, -1) ; y-axis

Dilations

Dilation is a type of transformation that causes an image to stretch or shrink in proportion to its original size.



A **Dilation** is a transformation that changes the size, but not the shape, of a figure.

Think about how your pupils dilate when you have to go to the eye doctor.

What Changes???

Dilation

ENLARGEMENT

small → BIG

is when you multiply by a scale factor > 1

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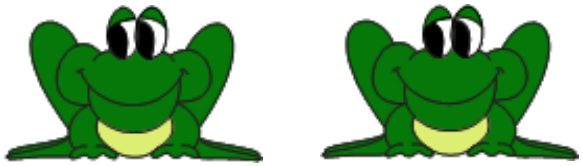
reduction

BIG → small

is when you multiply by a scale factor < 1 (a fraction)



1:1 Scale Factor

A Scale factor of 1 does not affect the size of the figure

Scale Factor - **the number you multiply by**

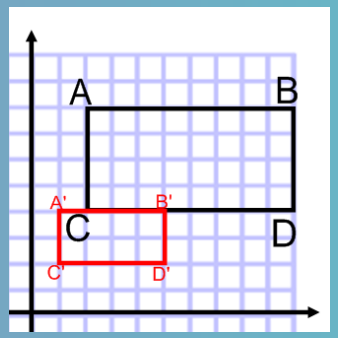
Rule for a dilation with a scale factor of n

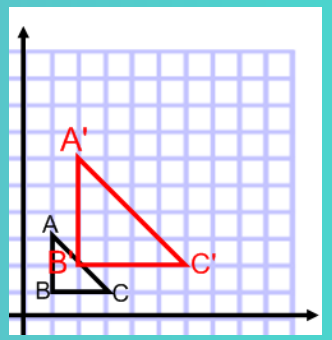
$(x, y) \longrightarrow (nx, ny)$

Multiply BOTH coordinates by the given Scale Factor.

To find the scale factor of a figure, choose a pair of corresponding sides and use the ratio:

Scale Factor Formula Just say "NO" → $\frac{\text{NEW}}{\text{ORIGINAL}}$





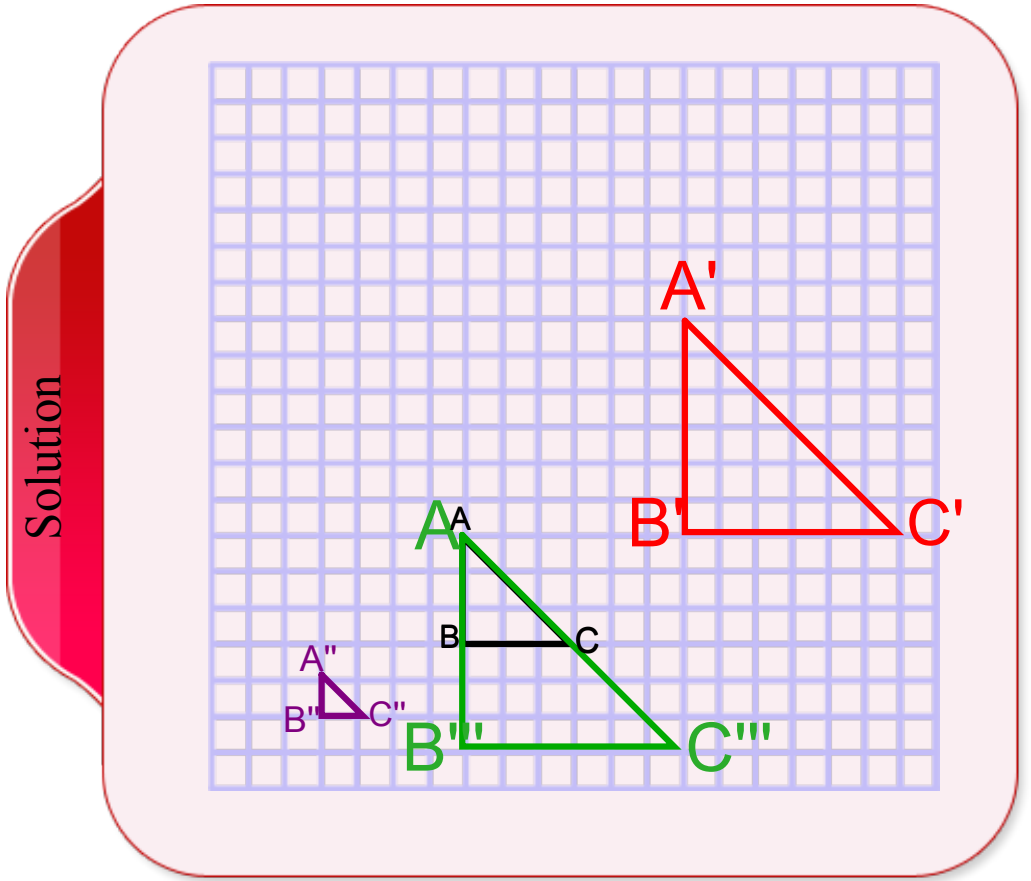
Let's Practice

Give the coordinates of the image of triangle ABC with vertices A(6, 6), B(6, 3), and C(9, 3) after a dilation of:

1) Scale factor of 2 with the origin as the center of dilation.

2) Scale factor of 1/3 with the origin as the center of dilation.

Solution



Similar Figures

Because a scale factor is used, dilations create figures which are similar.

Similar figures: have the same shape but not necessarily the same size.

- **Their corresponding angles are congruent**
- **Their corresponding sides are proportional in length (that means they have the same ratio or scale factor)**

Identify the scale factor in the pairs of images shown below

Image 1

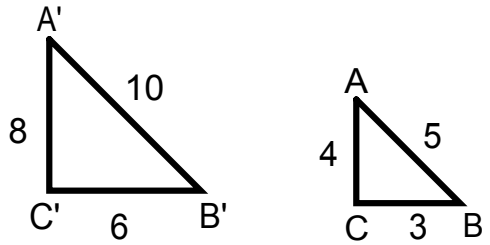
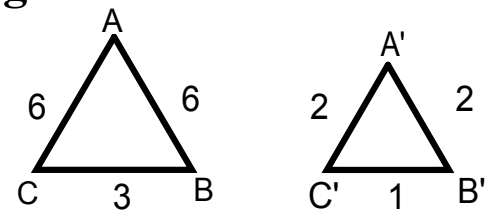


Image 2



Are the two figures similar?
Why or Why not?

Image 1

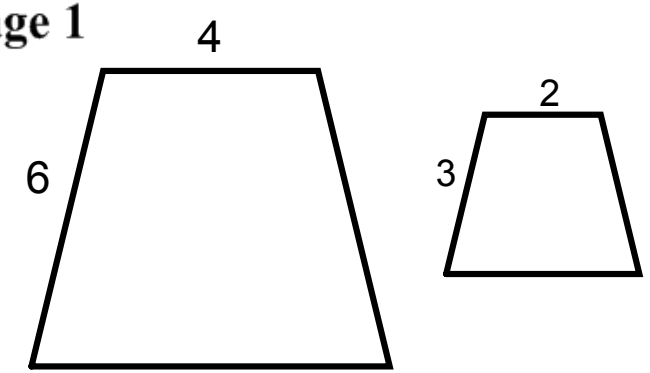
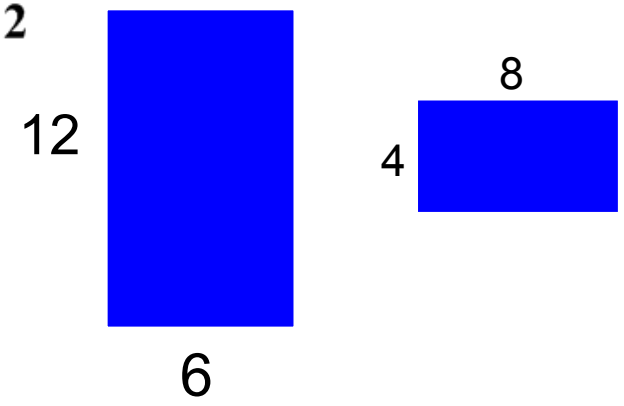
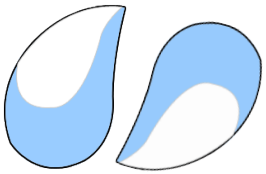


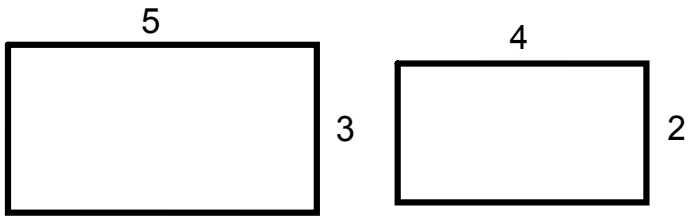
Image 2

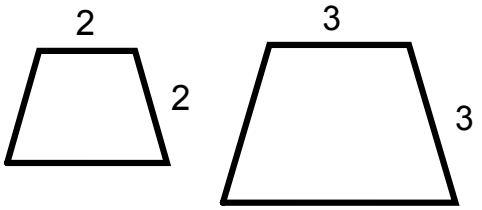


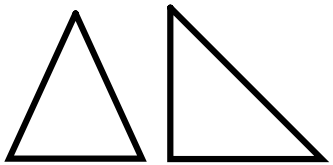
Activity

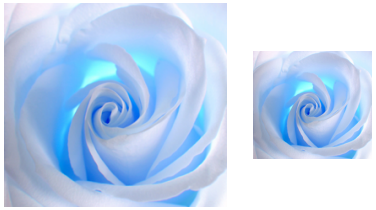
Press the pair of images that has a dilated image in it.



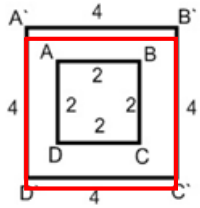


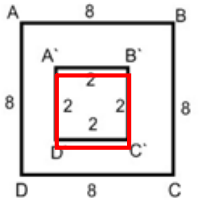


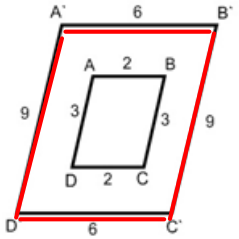


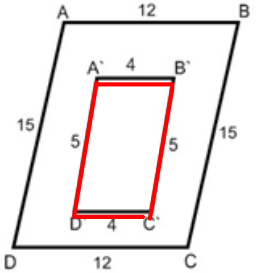


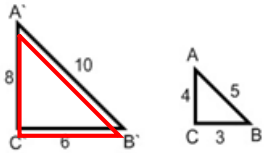
Activity - Identify Scale Factor
(1st determine if it is > 1 or < 1)

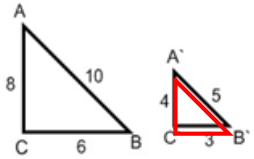


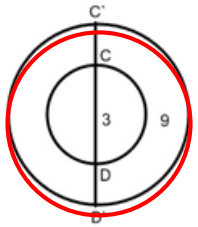


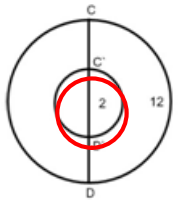




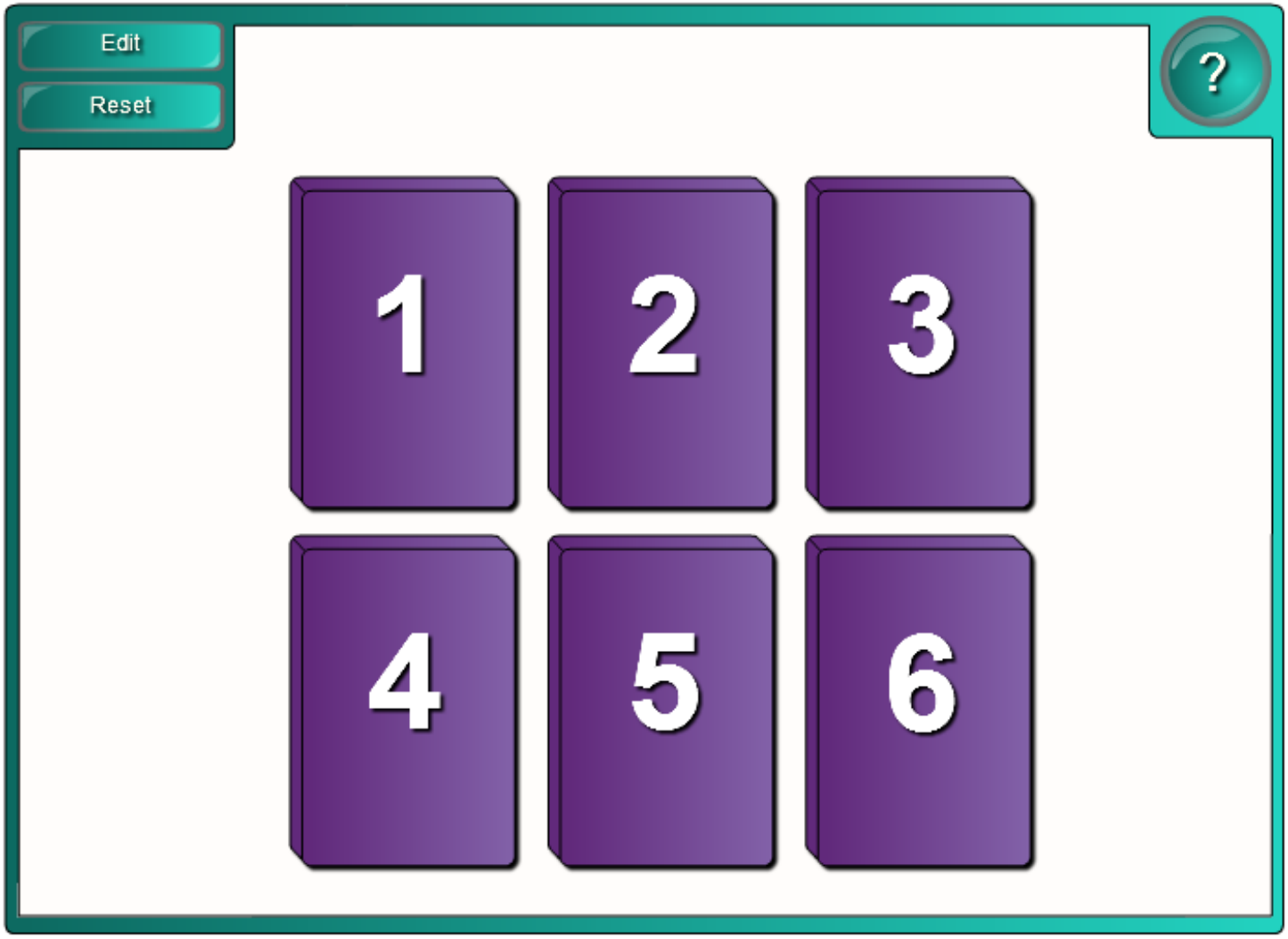








Identify the pair that has the dilated image in it.



Teacher's Notes

Constructing Dilations

Create the dilated image of a square, whose side measures 2 cm, with the origin as the center of dilation, and a scale factor of 2.

original coordinate

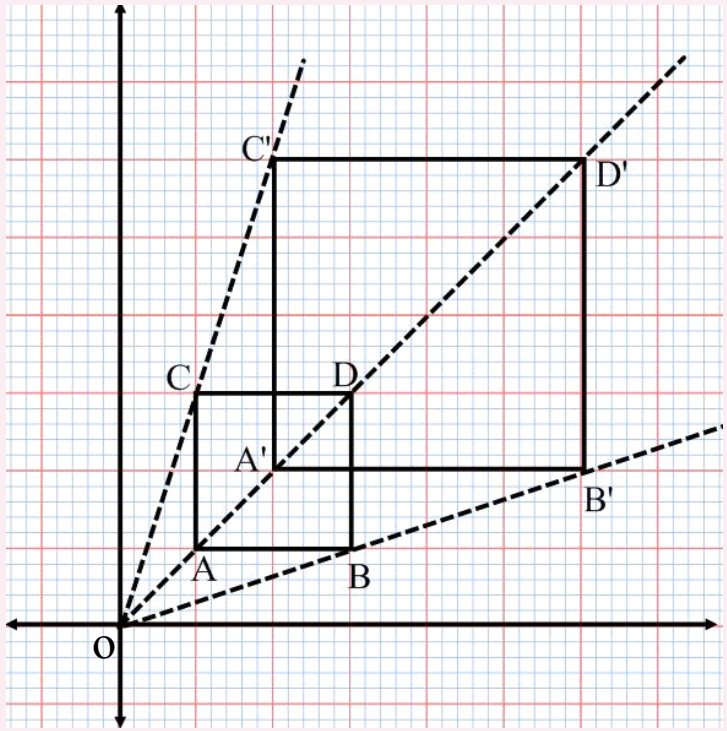
A _____

B _____

C _____

D _____

Solution



dilated coordinates

A' _____

B' _____

C' _____

D' _____

Constructing Dilations

Dilate square ABCD with the origin as the center of dilation and a scale factor of 1/3

original coordinates

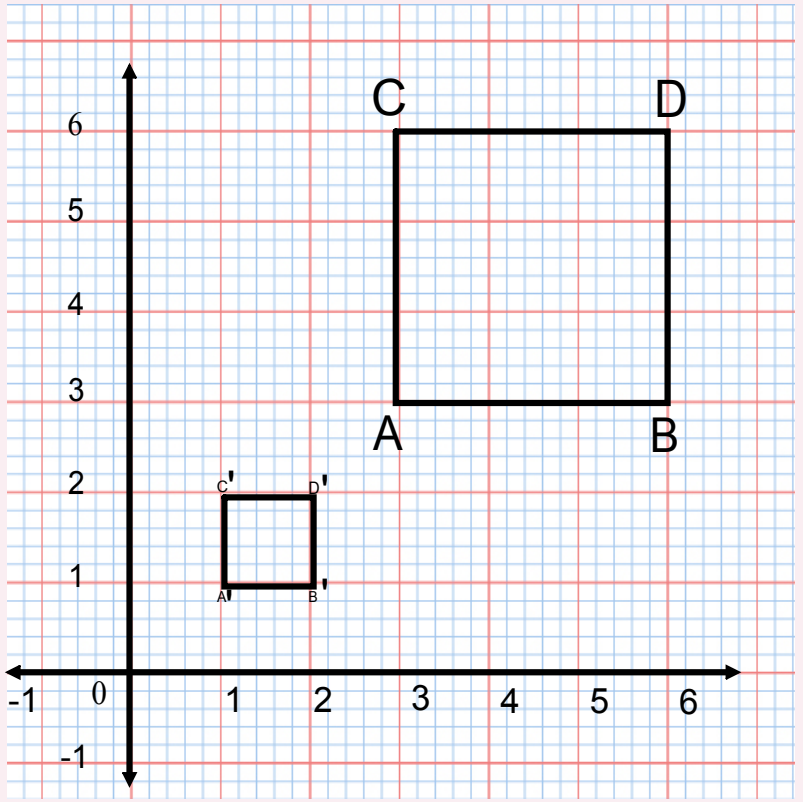
A _____

B _____

C _____

D _____

Solution



dilated coordinates

A' _____

B' _____

C' _____

D' _____

Constructing Dilations

Dilate square ABCD with the origin as the center of dilation and a scale factor of 4.

original coordinate

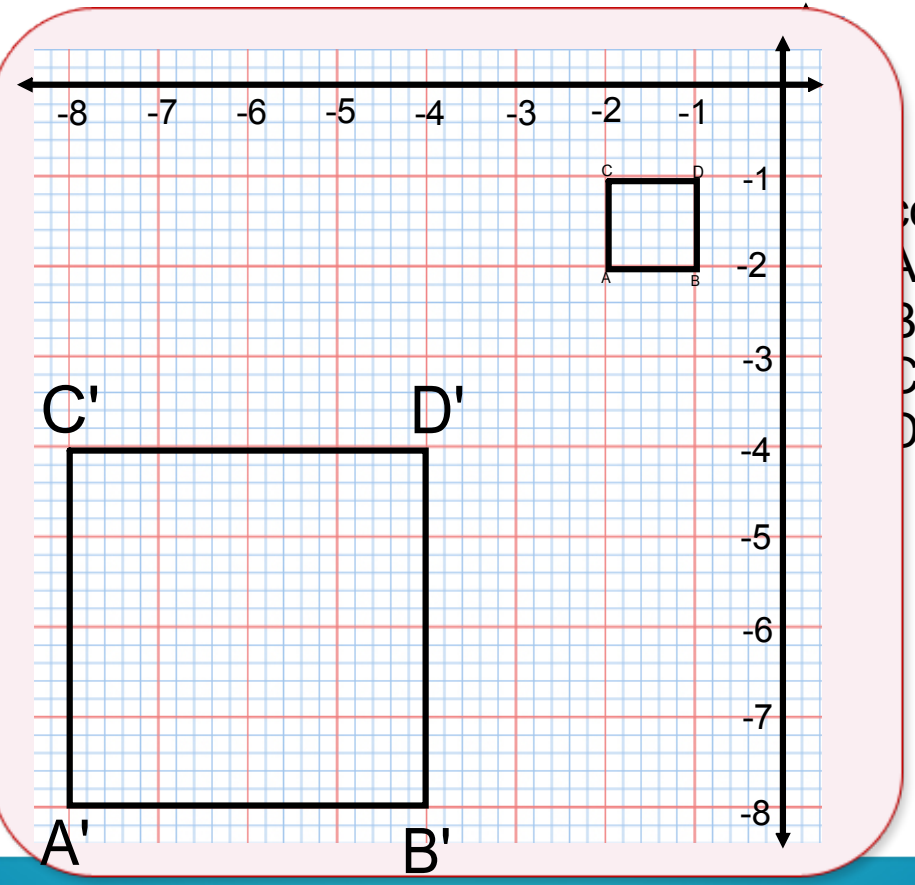
A _____

B _____

C _____

D _____

Solution



dilated coordinates

A' _____

B' _____

C' _____

D' _____

Constructing Dilations

Draw a dilation of a right-angled triangle with sides, 2 cm, 2 cm, and 2.82 cm, with the scale factor of 2 using the origin as the center of dilation.

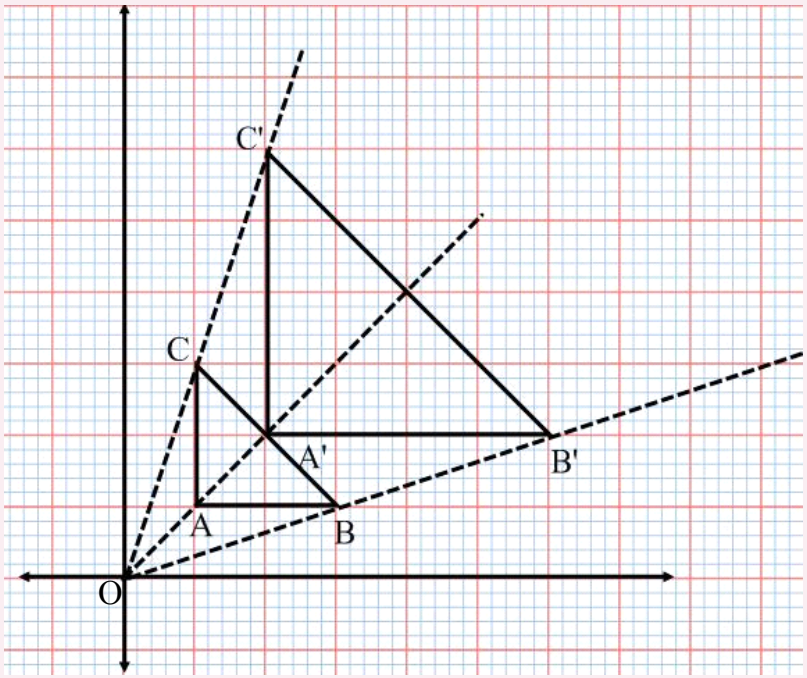
original coordinates

A _____

B _____

C _____

Dilated Image



dilated coordinates

A' _____

B' _____

C' _____

Check Your Understanding

1 Dilation is a type of transformation that causes an image to stretch or shrink in proportion to its original size.

True

False

Select the correct answer.

Check Your Understanding

2 The ratio by which the image stretches or shrinks is known as the scale factor.

True

False

Select the correct answer.

Check Your Understanding

3 Dilations create similar images with the change in the length of the sides or the area.

True

False

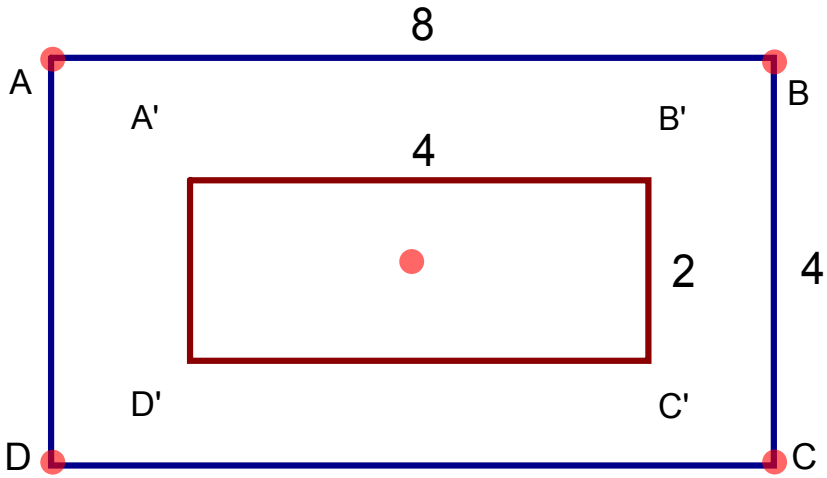
Select the correct answer.

Check Your Understanding

4 Rectangle A' B' C' D' is a dilated image of rectangle ABCD.

True

False



Select the correct answer.

Check Your Understanding

5 A table is 6 cm wide. After dilation, the table is 3 cm wide. Calculate the scale factor for this dilation.

A 1

B 2

C 1/2

D 1/3

Select the correct answer.

Check Your Understanding

6 If a balloon of diameter 2 cm is dilated with a scale factor of 1.5, then what is the diameter of the dilated balloon?

A 3

B 4

C 5

D 6

Select the correct answer.

Check Your Understanding

7 What is the scale factor for the given pair of images?

A 2

B ½

C 4

D ¼

48 inches

12 inches

Select the correct answer.

Check Your Understanding

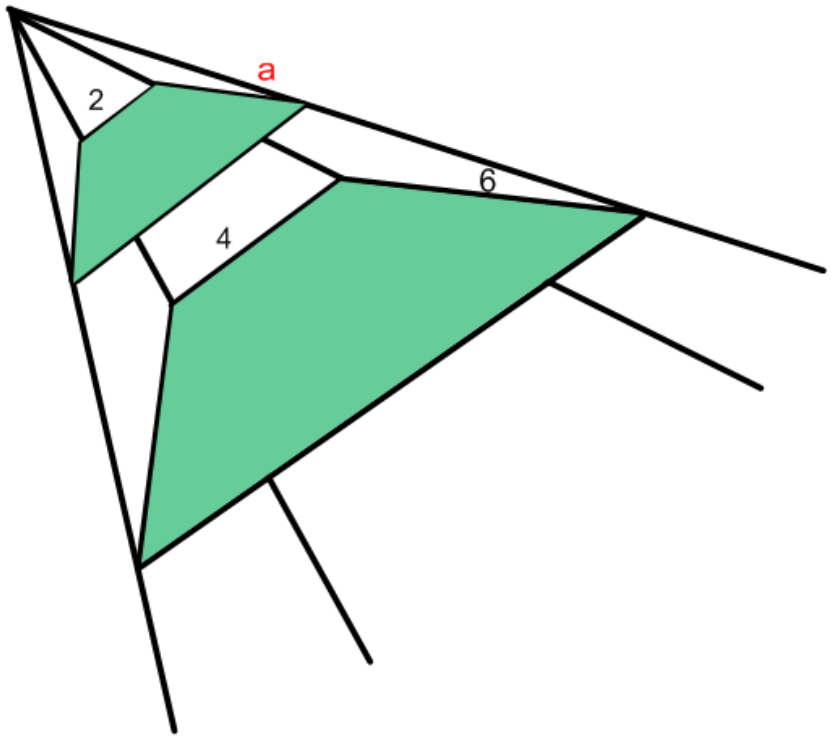
8 Identify the value of 'a' in the graphic.

A 1

B 2

C 3

D 4



Select the correct answer.

Check Your Understanding

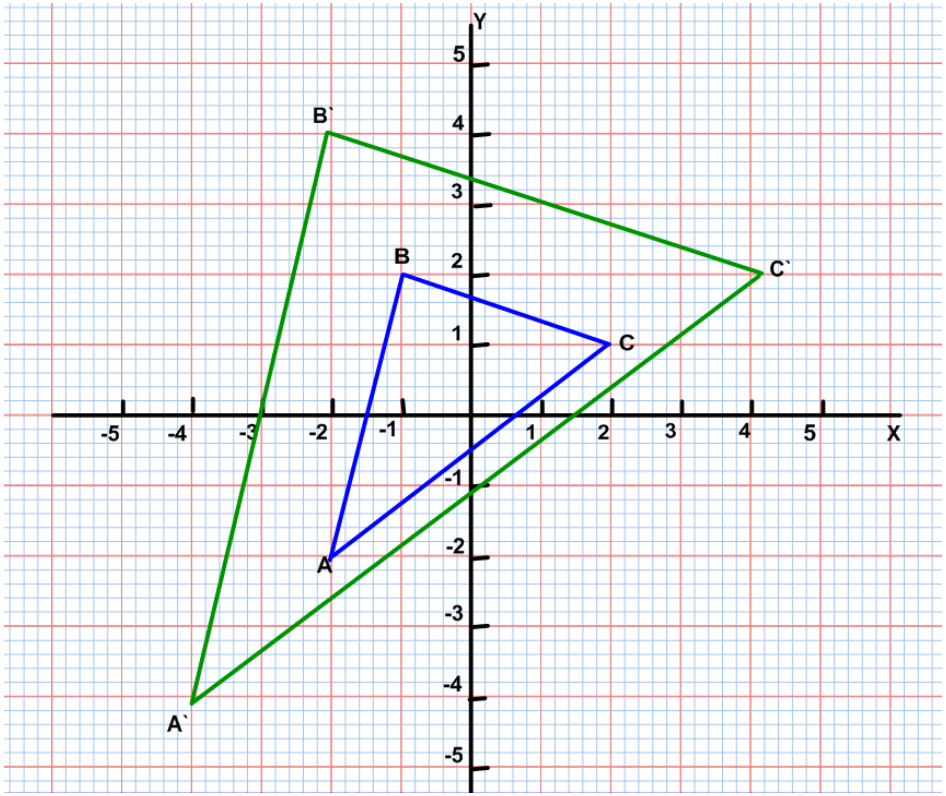
9 What is the scale factor of the dilation with centre as the origin?

A 2

B ½

C -2

D -1/2



Select the correct answer.

Check Your Understanding

10 What is the scale factor when triangle A (0,2), B (-2,2), C(-2,0) is dilated to A'(0,8), B'(-8,8), C'(-8,0)?

A 2

B 2.5

C 4

D 4.5

Select the correct answer.