Geometry Unit 9: Dilation and similarity

Bronx Early College Academy

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13 March 2023 - 31 March 2023

9.1 Dilation introduction 13 March

9.2 Solving for k, similarity 15 March

9.3 Overlapping triangle practice 16 March

9.4 Composition 17 March

9.5 Composition 21 March

9.6 Midline and medians 22 March

9.7 Midline and medians 24 March

Learning Target: I can dilate a triangle

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.1 Monday 13 March

Do Now

1. $12 \times \frac{1}{3} =$
2. $10 \times \frac{7}{5} =$
3. Find x if $9 \cdot x = 15$

Lesson: Dilation, transformations, fraction operations
Test results, check Jumprope

Homework: Complete the classwork practice, Deltamath problem set

A dilation centered at the origin with scale factor $k = 2$

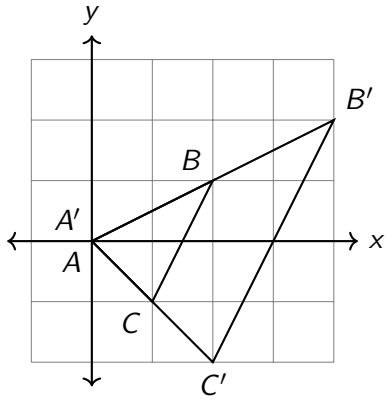
$\triangle ABC \to \triangle A'B'C'$

$A(0,0) \to A'(0,0)$
$B(2,1) \to B'(4,2)$
$C(1,-1) \to C'(2,-2)$

Dilation A transformation stretching objects on the plane by a scale factor away from a point

Center Dilation stretches figures away from a stationary point, the "center of dilation"

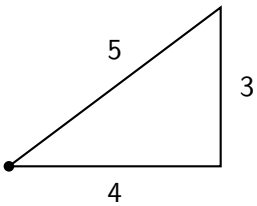
Scale factor The ratio k of the lengths of the corresponding sides of dilated figures



Learning Target: I can identify and explain similarity

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.2 Wednesday 15 March

Do Now: A triangle with side lengths 3, 4, and 5 is dilated by a factor of $k = 2$ centered at one of its vertices. Find the lengths of the image's sides.



Lesson: Similar objects, solving for scale factor k

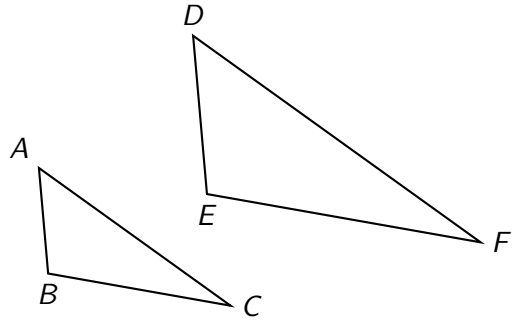
Homework: Complete the classwork practice, Deltamath problem set

Similarity, corresponding parts, and scaled proportions

Similarity Objects with the same shape, but not necessarily the same size, are similar. Their corresponding angles are congruent and their corresponding sides are proportional.

Notation This is the symbol for similar triangles: $\triangle ABC \sim \triangle DEF$

Definition Two figures are similar if one or more rigid motions and a dilation will carry one figure onto the other.



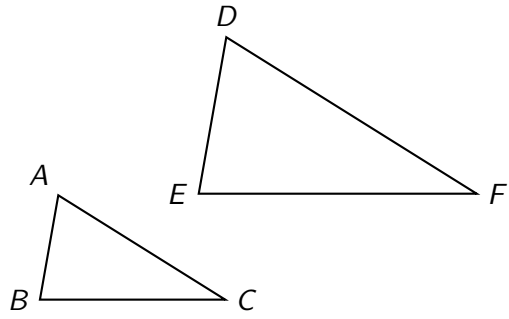
Learning Target: I can solve overlapping similar triangles

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.3 Thursday 16 March

Do Now: Given $\triangle ABC \sim \triangle DEF$, $k = 2$
If $BC = 4$, find EF
If $m\angle B = 80°$, find $m\angle E$

Lesson: Flexibly applying similarity to situations

Homework: Complete the classwork practice, Deltamath problem set

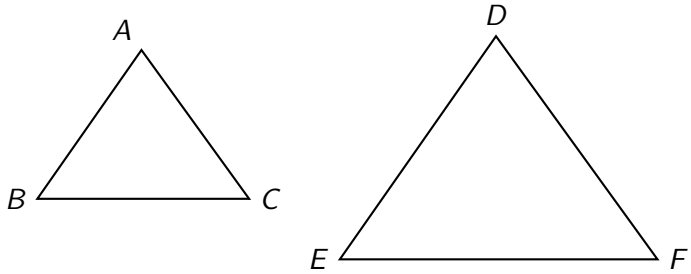


"Solve" a triangle by finding all of is sides' and angles' measures

Given $\triangle ABC \sim \triangle DEF$

$BC = 4$, $EF = 6$, $AB = 3$

$\text{m}\angle B = 55°$, $\text{m}\angle D = 70°$



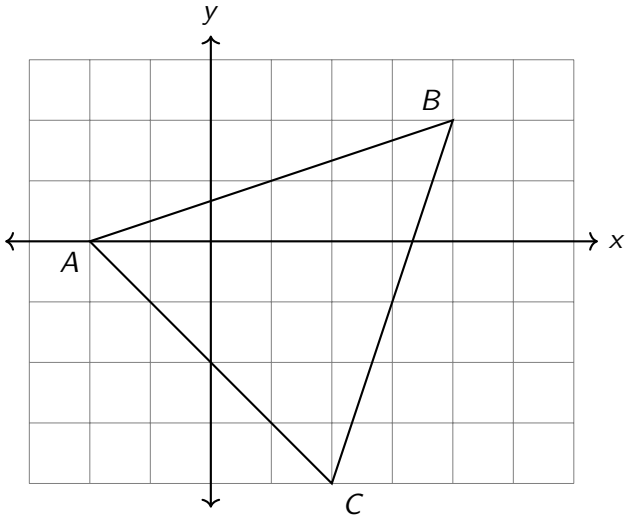
Apply a dilation centered at the origin with scale factor $k = \frac{1}{2}$

$\triangle ABC \rightarrow \triangle A'B'C'$

$A(-2, 0) \rightarrow$

$B(4, 2) \rightarrow$

$C(2, -4) \rightarrow$



Apply a dilation centered at the origin with scale factor $k = \frac{1}{2}$

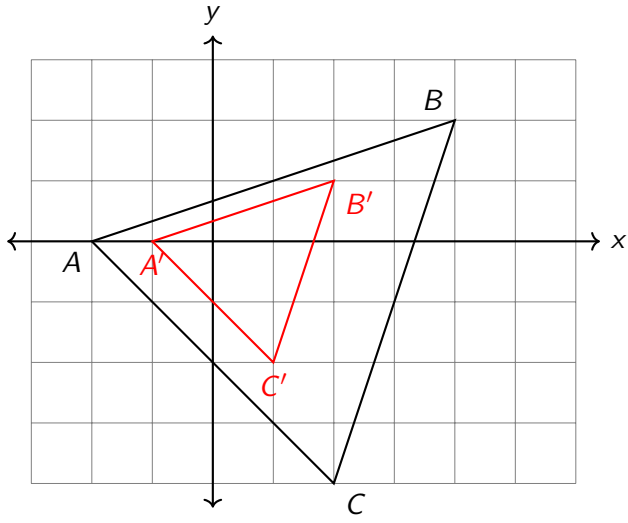
$\triangle ABC \rightarrow \triangle A'B'C'$

$A(-2, 0) \rightarrow A'(-1, 0)$

$B(4, 2) \rightarrow B'(2, 1)$

$C(2, -4) \rightarrow C'(1, -2)$

Note:
Slope is invariant under dilation



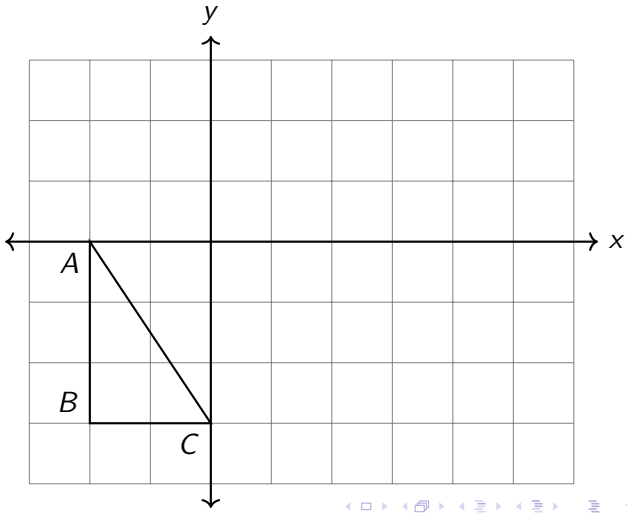
Learning Target: I can compose dilations with other transformations

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.4 Friday 17 March

Do Now:
First reflect $\triangle ABC$ over the y-axis
Then slide it up one and the right 3

Lesson: Applying dilation and rigid motions in compositions

Homework: Complete the classwork practice, Deltamath problem set



Learning Target: I can compose dilations with other transformations

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.4 Friday 17 March

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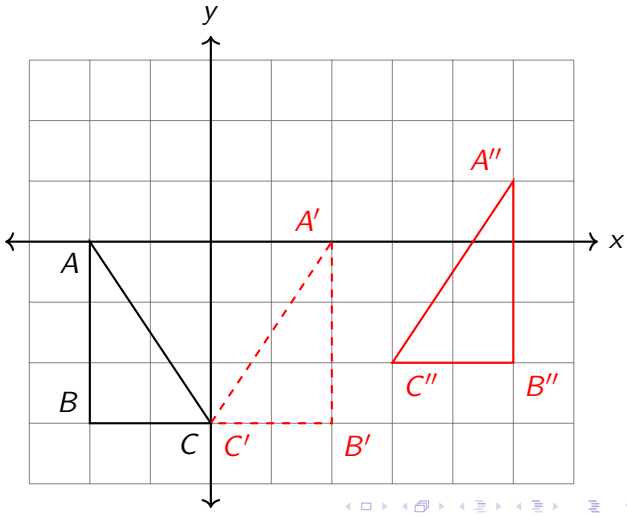
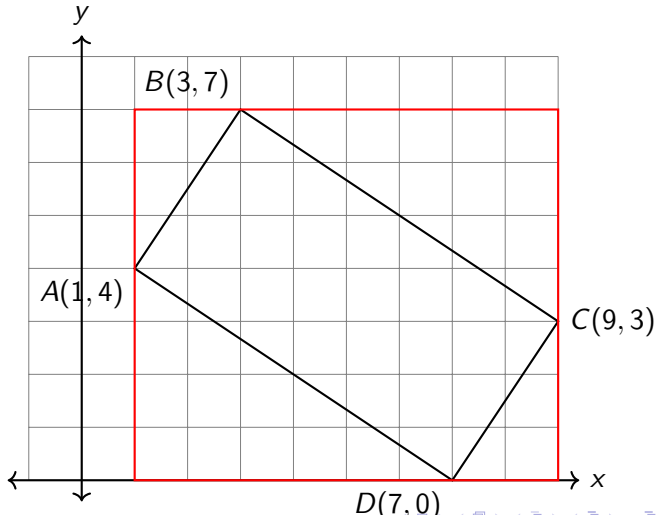


Find the area of the large and small rectangles

(use the areas of the small triangles)



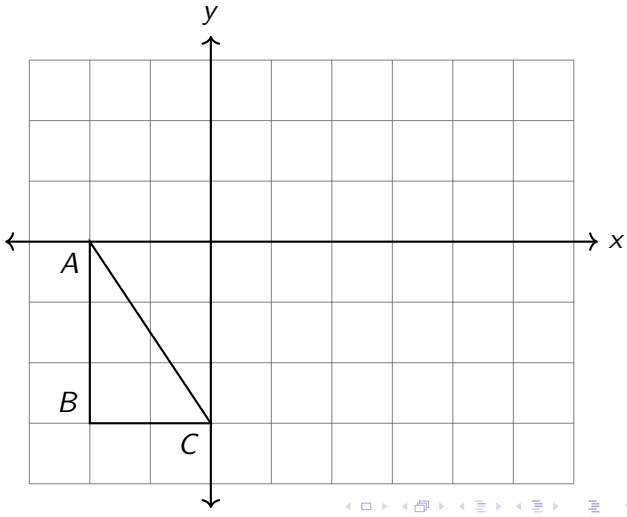
Learning Target: I can compose dilations with other transformations

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.5 Tuesday 21 March

Do Now:
First reflect $\triangle ABC$ over the y-axis
Then slide it up one and the right 3

Lesson: Applying dilation and rigid motions in compositions

Homework: Complete the classwork practice, Deltamath problem set



Learning Target: I can compose dilations with other transformations

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.5 Tuesday 21 March

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Lesson: Applying dilation and rigid motions in compositions

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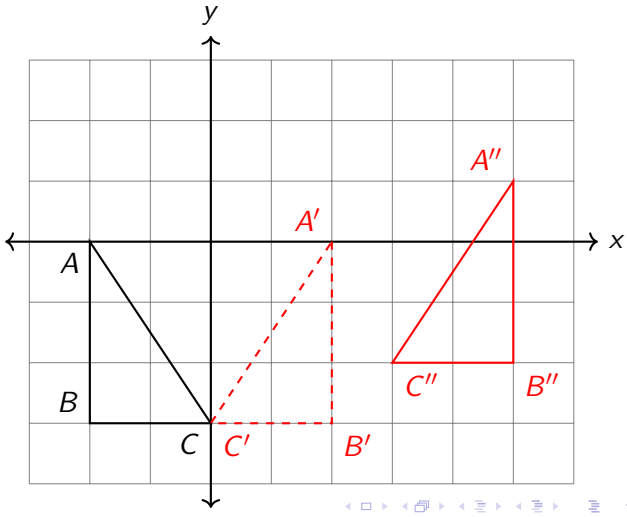


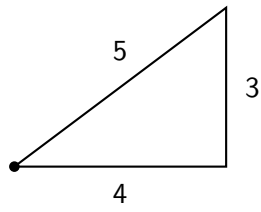
Learning Target: I can plot triangle midlines and medians

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.6 Wednesday 22 March

Do Now:
Rotating the triangle around its longer leg will make what 3-dimensional shape?

Lesson: Regents pointers. Be on time tomorrow.

Homework: Complete the classwork practice, Deltamath problem set



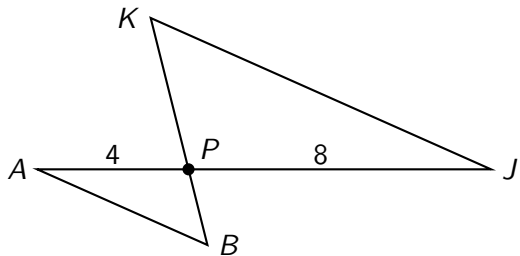
Learning Target: I can plot triangle midlines and medians

HSG.SRT.B.5 Use similarity criteria for triangles to solve problems 9.7 Friday 24 March

Do Now:
What sequence of transformations map similar triangles $\triangle ABP \rightarrow \triangle JKP$?

Lesson: Midlines and triangle medians

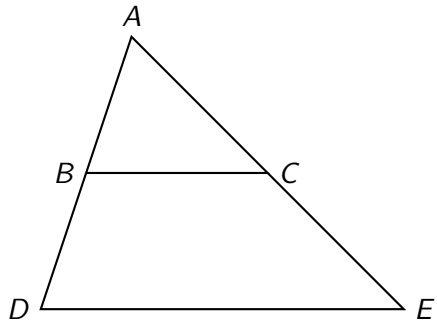
Homework: Complete the classwork practice, Deltamath problem set



Triangle midline and medians create similar triangles

Midpoint The point on a segment that divides the segment into two equal parts.

Midline The line segment that connects the midpoints of two sides of a triangle.



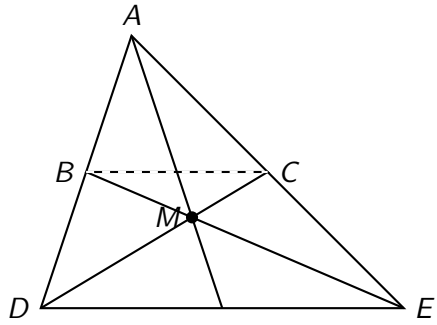
Triangle midline and medians create similar triangles

Midpoint The point on a segment that divides the segment into two equal parts.

Midline The line segment that connects the midpoints of two sides of a triangle.

Medians Segments connecting a vertex to the midpoint of the opposite side.

Centroid The point where the three medians intersect.



Notebook check scoring

Start quickly at the beginning of class: notebook, pencil, folder, calculator; get to work

Jumprope mastery score

1. I have a notebook $\rightarrow$ 1
2. I have class notes $\rightarrow$ 2
3. I have stars indicating I quickly sit down and write the learning target $\rightarrow$ 3
4. I have stars and I complete the Do Now right away $\rightarrow$ 4