

February 4, 2019, Monday

On the internet research "geometric dilation on a grid" and copy an example.

State 2 observations about your dilation.

Jan 24-9:32 AM

Dilations/Translations Worksheet

Directions: Answer the following questions to the best of your ability. For the y-axis, use the same scaling as the x-axis.

- In Math, the word dilate means to reduce or enlarge a figure.
- If a scale factor is less than 1, then your figure gets smaller.
- If a scale factor is greater than 1, then your figure gets larger.

6. Graph the dilated image of triangle KJL using a scale factor of 2 and the origin as the center of dilation.

$(2, 4) \times 2 = (4, 8)$
 $(1, 1) \times 2 = (2, 2)$
 $(4, 0) \times 2 = (8, 0)$

7. Graph the dilated image of quadrilateral MNQP using a scale factor of 3 and the origin as the center of dilation.

$M(1, 3) \times 3 = M'(3, 9)$
 $N(3, 2) \times 3 = N'(9, 6)$
 $O(7, -2) \times 3 = O'(-6, -6)$
 $P(-1, 0) \times 3 = P'(-3, 0)$

Feb 1-1:58 PM

6. Graph the dilated image of triangle XYZ using a scale factor of 1.5 and the origin as the center of dilation.

$(-4, 2) \times 1.5 = (-6, 3)$
 $(6, 0) \times 1.5 = (9, 0)$
 $(-2, -4) \times 1.5 = (-3, -6)$

7. Graph the dilated image of quadrilateral MNQP using a scale factor of 1.5 and the origin as the center of dilation.

$M(3, 9) \times 1.5 = M'(4.5, 13.5)$
 $N(6, 0) \times 1.5 = N'(9, 0)$
 $O(3, -6) \times 1.5 = O'(4.5, -9)$
 $P(-3, 0) \times 1.5 = P'(-4.5, 0)$

8. Describe the dilation of quadrilateral MNQP. Pick a point M(3,3) and dilate it by a scale factor of 1/3. $M'(1, 1)$

Reduction/shrink (less than 1)
 Enlarge (greater than 1)
 division: 3
 OR $\frac{1}{3}$

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9. The table below shows the coordinates of triangle RST and the coordinates of R' in triangle R'S'T'. Triangle R'S'T' is a dilation of triangle RST.

Triangle RST	Scale Factor k	Triangle R'S'T'
R (-2, -3)	3	R' (4, -9)
S (0, 0)		S' (0, 0)
T (2, -3)		T' (6, -9)

Part A: What are the coordinates of point S' and point T'?

Answer: S' = (0, 0), T' = (6, -9)

Part B: On the grid below, draw triangle RST and triangle R'S'T'.

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Do the following problem with the class, then write down the process on the right:

Dilate $\triangle ADR$, $A(1, 1)$, $D(0, 2)$, $R(3, 1)$ by a scale factor of 2 from the origin.

A' () D' () R' ()
 B' () C' ()

How do you do a dilation from the origin?
 Multiply by the scale factor, k

What are the important pieces of information given for a dilation?
 The scale factor

Do the next 4 dilation problems. Check your answers with a neighbor.

- Dilate $\triangle QRS$ if $Q(-1, 3)$, $R(1, 2)$, $S(2, 1)$ by a scale factor of 2 from the origin.
- Dilate $\triangle TUV$ if $T(-1, -2)$, $U(1, 0)$, $V(2, 3)$ by a scale factor of 3 from the origin.
- Dilate $\triangle XYZ$ if $X(-4, 0)$, $Y(4, 4)$, $Z(-2, -2)$ by a scale factor of $\frac{1}{2}$ from the origin.
- Dilate $\triangle HAT$ if $H(-1, -1)$, $A(1, 0)$, $T(2, 2)$ by a scale factor of 2 from the origin.

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Practice and check your work!

Dilations and Scale Factors: Independent Practice Worksheet

- Graph the image of rectangle KLMN after dilation with a scale factor of 2, centered at the origin.
- Graph the image of rectangle PQRS after dilation with a scale factor of 1/2, centered at the origin.
- Graph the image of quadrilateral EFGH after dilation with a scale factor of 2, centered at the origin.
- Graph the image of quadrilateral PQRS after dilation with a scale factor of 1/2, centered at the origin.
- Graph the image of quadrilateral PQST after dilation with a scale factor of 2, centered at the origin.
- Graph the image of quadrilateral PQRS after dilation with a scale factor of 1/2, centered at the origin.
- Graph the image of triangle GHI after dilation with a scale factor of 1/2, centered at the origin.
- Graph the image of quadrilateral KLMN after dilation with a scale factor of 3, centered at the origin.
- Graph the image of rectangle RSTU after dilation with a scale factor of 1/2, centered at the origin.
- Graph the image of quadrilateral ABCD after dilation with a scale factor of 1/2, centered at the origin.

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Name _____ Date _____

Dilations and Scale Factors - Independent Practice Worksheet

Complete all the problems.

1. Graph the image of rectangle KLMN after dilation with a scale factor of 2, centered at the origin.

2. Graph the image of rectangle PQRS after a dilation with a scale factor of 1/4, centered at the origin.

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Name _____ Date _____

3. Graph the image of quadrilateral EFGD after a dilation with a scale factor of 3, centered at the origin.

4. Graph the image of quadrilateral PQRS after a dilation with a scale factor of 2, centered at the origin.

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5. Graph the image of quadrilateral FGHI after a dilation with a scale factor of 3/5, centered at the origin.

6. Graph the image of rectangle PQRS after a dilation with a scale factor of 2, centered at the origin.

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7. Graph the image of triangle FGH after a dilation with a scale factor of 5, centered at the origin.

8. Graph the image of quadrilateral KLMN after a dilation with a scale factor of 3, centered at the origin.

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7. Graph the image of triangle FGH after a dilation with a scale factor of 5, centered at the origin.

8. Graph the image of quadrilateral KLMN after a dilation with a scale factor of 3, centered at the origin.

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February 5, 2019, Tuesday

using the transformation given.

2) dilation of 2 about the origin

2) dilation of 2 about the origin

Handwritten notes on a pink background:

$U(\frac{3}{4}, 0)$

$r = -1.2$
 $8.12 \times 2 = 16.24$
 -2.1
 0.0

$r = -2.4$
 $8.24 \times 2 = 16.48$
 -4.2
 0.0

$(-0.5, -0.5)$
 $(-0.5, 0.5)$
 $(7.5, 0)$

Jan 24-8:06 AM

Similar Figures Worksheet Name: _____ Hour: _____

Fill in the blank with the appropriate word, phrase, or symbol to make a true statement.

- Similar figures have the same shape, but not necessarily the same size.
- The symbol \sim means "is similar to" and the symbol \cong is the abbreviation for the word congruent.
- A dilated drawing is an enlarged or reduced drawing that is similar to an actual object or figure.
- In similar triangles, corresponding angles are congruent and corresponding sides are in proportion.
- To find a missing side length set up and solve a proportion for the measurements of the similar figures. proportion is a fraction

Learning Goal # 1: I can identify the corresponding parts of similar figures.

Example: The figures in each pair are similar. Similarity Statement

$\triangle ABC \sim \triangle DEF$

$\angle A$ corresponds with $\angle D$ $\angle B$ matches with $\angle E$ $\angle C$ corresponds with $\angle F$

AB matches with DE BC matches with EF AC matches with DF

Practice Problems:

- $\triangle NPT \sim \triangle OQR$
 First, label $\angle D, \angle O, \angle G$ on the small triangle. Then, fill in the blanks below:
 $\angle D$ corresponds with $\angle O$ DO matches with OR
 $\angle O$ matches with $\angle T$ OT matches with TR
 $\angle G$ corresponds with $\angle R$ GR matches with RR
 Suppose $\angle S = 25^\circ$, what is the measure of $\angle D$? 25
- $\triangle HQT \sim \triangle PIG$
 $\angle H$ corresponds with $\angle P$ HT matches with PT
 $\angle O$ matches with $\angle G$ IG corresponds with TH
 $\angle T$ corresponds with $\angle I$ GI matches with IT

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Learning Goal # 2: I can find the missing measurements of two similar figures.

Example 1: The figures in each pair are similar. $\triangle ABC \sim \triangle DEF$

$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

$\frac{4}{8} = \frac{3}{6} = \frac{x}{12}$

$\frac{4}{8} = \frac{3}{6}$ $\frac{4}{2} = \frac{3}{2}$ $2 = 1.5$

$\frac{4}{8} = \frac{x}{12}$ $4 \cdot 12 = 8x$ $48 = 8x$ $6 = x$

Example 2: The figures in each pair are similar. $\triangle ABC \sim \triangle DEF$

$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

$\frac{3}{6} = \frac{4}{8} = \frac{5}{10}$

$\frac{3}{6} = \frac{4}{8}$ $\frac{1}{2} = \frac{1}{2}$ $1 = 1$

$\frac{3}{6} = \frac{5}{10}$ $3 \cdot 10 = 6 \cdot 5$ $30 = 30$

Practice Problems:

- Find the missing side length in each similar figure. Show Work!
- $\triangle ABC \sim \triangle DEF$
 $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 $\frac{6}{10} = \frac{7}{x} = \frac{10}{15}$
 $\frac{6}{10} = \frac{7}{x}$ $6x = 70$ $x = \frac{70}{6} = 11\frac{2}{3}$
- $\triangle ABC \sim \triangle DEF$
 $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 $\frac{4}{8} = \frac{3}{6} = \frac{5}{10}$
 $\frac{4}{8} = \frac{3}{6}$ $\frac{1}{2} = \frac{1}{2}$ $1 = 1$
- $\triangle ABC \sim \triangle DEF$
 $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 $\frac{3}{6} = \frac{4}{8} = \frac{5}{10}$
 $\frac{3}{6} = \frac{4}{8}$ $\frac{1}{2} = \frac{1}{2}$ $1 = 1$
- $\triangle ABC \sim \triangle DEF$
 $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 $\frac{4}{8} = \frac{3}{6} = \frac{5}{10}$
 $\frac{4}{8} = \frac{3}{6}$ $\frac{1}{2} = \frac{1}{2}$ $1 = 1$

Jan 31-8:10 AM

Geometry -- U2 Day 9, 2/6/2017

Congruence: SSS SAS AAS HL ASA = equal
VS
2 Column Proofs for Similar Triangles
Similarity: AA, SSS, SAS = dilation

3 Methods for Proving 2 Triangles are Similar

AA $\angle A \cong \angle D$ $\angle C \cong \angle F$
 $\triangle ABC \sim \triangle DEF$

SSS $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 $\triangle ABC \sim \triangle DEF$

SAS $\frac{AB}{DE} = \frac{AC}{DF}$ $\angle A \cong \angle D$
 $\triangle ABC \sim \triangle DEF$

Fill in the blanks for each 2 column proof below.

- Given: $\angle A \cong \angle D$ and $\angle B \cong \angle E$
 Prove: $\triangle ABC \sim \triangle DEF$
 Statements: $\angle A \cong \angle D$ 1. Given
 $\angle B \cong \angle E$ 2. Given
 $\triangle ABC \sim \triangle DEF$ 3. AA
 Reasons: 1. Given
 2. Given
 3. AA
- Given: $\frac{MN}{PQ} = \frac{NO}{QR}$ and $\angle N \cong \angle Q$
 Prove: $\triangle MNO \sim \triangle PQR$
 Statements: $\frac{MN}{PQ} = \frac{NO}{QR}$ 1. Given
 $\angle N \cong \angle Q$ 2. Given
 $\triangle MNO \sim \triangle PQR$ 3. SAS
- Given: $\frac{ST}{UV} = \frac{TV}{VW}$ and $\angle S \cong \angle U$
 Prove: $\triangle STU \sim \triangle VWX$
 Statements: $\frac{ST}{UV} = \frac{TV}{VW}$ 1. Given
 $\angle S \cong \angle U$ 2. SSS
 Reasons: 1. Given
 2. SSS
- Given: $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 Prove: $\triangle ABC \sim \triangle DEF$
 Statements: 1. Given
 2. $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 Reasons: 1. Given
 2. SSS

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- Given: $\triangle MNO \sim \triangle PQR$
 Prove: $\triangle MNO \sim \triangle PQR$
 Statements: 1. $\triangle MNO \sim \triangle PQR$
 Reasons: 1. Given
- Given: $\triangle MNO \sim \triangle PQR$
 Prove: $\triangle MNO \sim \triangle PQR$
 Statements: 1. $\triangle MNO \sim \triangle PQR$
 Reasons: 1. Given
- Given: $\triangle MNO \sim \triangle PQR$
 Prove: $\triangle MNO \sim \triangle PQR$
 Statements: 1. $\triangle MNO \sim \triangle PQR$
 Reasons: 1. Given
- Given: $\triangle MNO \sim \triangle PQR$
 Prove: $\triangle MNO \sim \triangle PQR$
 Statements: 1. $\triangle MNO \sim \triangle PQR$
 Reasons: 1. Given

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Create your own 2 column proof for the following similar triangles.

- Prove: $\triangle SUP \sim \triangle PVT$
 Given: $\angle S \cong \angle T$
 Statements: 1. $\angle S \cong \angle T$
 Reasons: 1. Given
 2. $\angle S \cong \angle T$
 3. $\angle S \cong \angle T$
- Given: $\frac{GH}{JK} = \frac{GI}{JL}$ and $\angle G \cong \angle J$
 Prove: $\triangle GHJ \sim \triangle KJL$
 Statements: 1. $\frac{GH}{JK} = \frac{GI}{JL}$
 Reasons: 1. Given
 2. $\angle G \cong \angle J$
- Given: $\angle M \cong \angle P$, $\angle O \cong \angle Q$
 Prove: $\triangle OMN \sim \triangle PQR$
 Statements: 1. $\angle M \cong \angle P$
 Reasons: 1. Given
 2. $\angle O \cong \angle Q$
- Given: $\frac{AB}{DC} = \frac{AC}{CE}$ and $\angle B \cong \angle D$
 Prove: $\triangle ABC \sim \triangle DCE$
 Statements: 1. $\frac{AB}{DC} = \frac{AC}{CE}$
 Reasons: 1. Given
 2. $\angle B \cong \angle D$

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- Given: $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 Prove: $\triangle ABC \sim \triangle DEF$
 Statements: 1. $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
 Reasons: 1. Given
- Given: $\triangle MNO \sim \triangle PQR$
 Prove: $\triangle MNO \sim \triangle PQR$
 Statements: 1. $\triangle MNO \sim \triangle PQR$
 Reasons: 1. Given
- Given: $\frac{NO}{QP} = \frac{PO}{PQ}$
 Prove: $\triangle MNO \sim \triangle PQR$
 Statements: 1. $\frac{NO}{QP} = \frac{PO}{PQ}$
 Reasons: 1. Given
- Given: $\frac{AB}{DC} = \frac{AC}{CE}$ and $\angle B \cong \angle D$
 Prove: $\triangle ABC \sim \triangle DCE$
 Statements: 1. $\frac{AB}{DC} = \frac{AC}{CE}$
 Reasons: 1. Given
 2. $\angle B \cong \angle D$

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Your turn...

Geometry Name: _____ ID: 1
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Triangle Similarity (SAS, SSS, AA???) Date: _____ Period: _____

State if the triangles in each pair are similar.

1) $\triangle PQR \sim \triangle RSM$

 2)

3) $\triangle PQR \sim \triangle RSM$

4) $\triangle PQR \sim \triangle RSM$

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State if the triangles in each pair are similar. If so, state how you know they are similar.

5)

6) $\triangle LMN \sim \triangle RST$

7) $\triangle TSR \sim \triangle RSM$

8) $\triangle RKL \sim \triangle TUS$

State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

9)

10)

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11)

12)

Solve for x . The triangles in each pair are similar.

13) $\triangle RKL \sim \triangle TUS$

14) $\triangle TUV \sim \triangle PFG$

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15) $\triangle TSR \sim \triangle LMN$

16) $\triangle DCB \sim \triangle LMN$

Find the missing length. The triangles in each pair are similar.

17) $\triangle TUS \sim \triangle RSM$

18) $\triangle PQR \sim \triangle RSM$

19) $\triangle KLM \sim \triangle ABC$

20) $\triangle DEF \sim \triangle MLK$

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February 6, 2019, Wednesday

What are the 3 ways to prove triangle similarity?
 Write an example of a set of triangles using one of the ways...

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Geometry - 12 (by 20, 2/20/2017) || Lines Revisited, Exterior < Theorem, & Midsegment Theorem Notes
 Parallel Lines - Revised
 p||q and t is the transversal.

<1 & <2 are _____ which means _____
 <1 & <3 are _____ which means _____
 <3 & <5 are _____ or _____ which means _____
 <1 & <6 are _____ which means _____
 <8 & <1 are _____ which means _____
 <4 & <5 are _____ which means _____
 Examples:

Identify the type of angles shown, then find the measure of the angle indicated in bold.

1)

2)

3)

4)

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Exterior Angle Theorem
 An exterior angle of a triangle is _____ to the _____ of the _____.

Examples: Find the measure of each angle indicated.

1)

2)

Solve for x:

3)

4)

Find the measure of the angle indicated.

5) Find m$\angle G$.

6) Find m$\angle ERS$.

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Mid-segment Theorem
 The mid-segment of a triangle (also called a midline) is a _____ joining the _____ of two sides of a triangle.

Examples: Find the missing length indicated.

1) Find RQ.

2) Find EG.

Solve for x:

3)

4)

Find the missing length indicated.

5) Find RQ.

6) Find AZ.

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February 7, 2019 Thursday

State if the triangles in each pair are similar. If so, state how you know they are similar using AA, SAS, or SSS.

1) $\triangle PQR \sim \triangle LWT$ $\triangle CDE \sim \triangle CGH$

2)

State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

3)

similar, state similarity, state

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Sec 3.2 Geometry - Constructions

1. [COPY SEGMENT] Construct a segment with an endpoint of C and congruent to the segment AB.

2. [COPY ANGLE] Construct an angle with ray HI and congruent to the angle LKJ.

3. [PERPENDICULAR BISECTOR] Construct a perpendicular bisector to the segment AB.

4. [ANGLE BISECTOR] Construct an angle bisector of the angle LDEF.

Using a ruler measure the two lengths to make sure they have the same measure.

Using a protractor measure the two angles to make sure they have the same measure.

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3. [Perpendicular Bisector] Construct a perpendicular bisector to the segment AB.

Using a ruler measure the two halves of the segment to make sure they have the same measure.

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4. [Angle Bisector] Construct an angle bisector of the angle LDEF.

Using a ruler measure the two halves of the segment to make sure they have the same measure.

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7. [Triangle Inscribed in a Circle] Construct a circle with radius \overline{AB} and an inscribed regular triangle.

Step 1: Start by placing the needle on the point A and the pencil on the other endpoint of the radius. Create the entire circle with the compass.

Step 2: With the compass still open to the exact length of the radius place the needle on the endpoint of the radius that is on the circle and with the pencil mark an intersection on the circle with a new arc.

Step 3: Leaving the compass still open to the same length move the needle to the point on the circle. Continue repeating this process until you have made 6 arcs around the circle.

Step 4: The last mark should end right where you started with the needle. Then, connect every other consecutive arc intersection with a segment.

At the bottom of the page, there is a line segment \overline{AB} and the text "At the top of the page, there is a line segment \overline{AB} ".

At the bottom of the page, there is a line segment \overline{AB} and the text "At the top of the page, there is a line segment \overline{AB} ".

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8. [Square Inscribed in a Circle] Construct a circle with radius \overline{AB} and an inscribed square.

Step 1: Start by placing the needle on the point A and the pencil on the other endpoint of the radius. Create the entire circle with the compass.

Step 2: Use your straight edge to draw a diameter of the circle. Create a perpendicular bisector of the diameter.

Step 3: Create a perpendicular bisector of the newly created diameter line (previous construction #2 if needed).

Step 4: Connect the each endpoint of the diameter with each endpoint of where the perpendicular bisector intersects the circle.

At the bottom of the page, there is a line segment \overline{AB} and the text "At the top of the page, there is a line segment \overline{AB} ".

At the bottom of the page, there is a line segment \overline{AB} and the text "At the top of the page, there is a line segment \overline{AB} ".

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9. [Construct a Parallel Line given a point and a line] Construct a parallel line to \overline{AB} through point C .

Step 1: Start drawing a parallel line that passes through point C and intersects line \overline{AB} .

Step 2: Open the compass so that the mouth is on the intersection of the new line just created and line \overline{AB} . Then, open the compass until it reaches the distance to reach point C . Create an arc above line \overline{AB} .

Step 3: Leave the compass set to the same opening and create another arc of the same radius but with the needle at point C .

Step 4: Put the compass needle on the intersection of the horizontal line and the arc that you created as shown below and open the pencil to the intersection of the first arc and line \overline{AB} . Create a small arc to verify the intersection of the arcs mark the correct intersection.

Step 5: Leave the compass open to the same length as the previous step and put the compass needle on the intersection of the horizontal line and the second arc that you created. Then, create an arc of the same radius to intersect the second arc created as shown below.

Step 6:

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At the bottom of the page, there is a line segment \overline{AB} and the text "At the top of the page, there is a line segment \overline{AB} ".

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February 8, 2019, Friday

5. What does this construction show?

A. congruent segments
B. perpendicular bisector
C. bisected angle
D. parallel lines

6. What does this construction show?

A. congruent segments
B. perpendicular bisector
C. bisected angle
D. parallel lines

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<https://www.mathopenref.com/tocs/constructionstoc.html>

Lines

- Copy a line segment
- Sum of line segments
- Difference of two line segments
- Perpendicular bisector of a line segment
- Divide a line segment into n equal segments
- Perpendicular to a line at a point on the line
- Perpendicular to a line from an external point
- Perpendicular to a ray at its endpoint
- A parallel to a line through a point (angle copy method)
- A parallel to a line through a point (rhombus method)
- A parallel to a line through a point (translated triangle method)

Angles

- Copy an angle
- Bisect an angle
- Construct a 30° angle
- Construct a 45° angle
- Construct a 60° angle
- Construct a 90° angle (right angle)
- Sum of n angles
- Difference of two angles
- Supplementary angle
- Complementary angle
- Constructing 75° 105° 120° 150° angles and more

Triangles

- Copy a triangle
- Triangle, given all 3 sides (SSS)
- Triangle, given one side and adjacent angles (ASA)
- Triangle, given two sides and included angle (SAS)
- Triangle, given two sides and non-included angle (AAS)
- Isosceles Triangle, given base and one side
- Isosceles Triangle, given base and altitude
- Isosceles Triangle, given leg and apex angle
- 30-60-90 right triangle given the hypotenuse
- Equilateral Triangle
- Midsegment of a Triangle
- Medians of a Triangle
- Altitudes of a Triangle
- Altitudes of a Triangle (outside case)

Polygons

- Square given one side
- Square inscribed in a circle
- Hexagon given one side
- Equilateral triangle inscribed in a circle
- Hexagon inscribed in a circle
- Pentagon inscribed in a circle

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Quiz like EOC problems for constructions...

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