

Mathematics II Resources for EOC Remediation

G-SRT Similarity & Right Triangle Cluster:

G-SRT.A.2

G-SRT.B.5

G-SRT.C.7

G-SRT.C.8

The information in this document is intended to demonstrate the depth and rigor of the Nevada Academic Content Standards. The items are **not** to be interpreted as indicative of items on the EOC exam. These are a collection of standard-based items for students and **only** include those standards selected for the Math II EOC examination.

G-SRT Similarity & Right Triangle Cluster

G-SRT.A.2 Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.

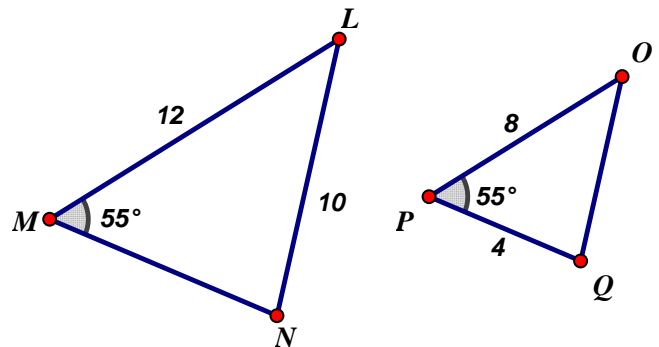
1. $\triangle ABC$ is dilated and maps onto $\triangle DEF$. In $\triangle ABC$ $m\angle A = 30^\circ$ and $m\angle B = 112^\circ$. In $\triangle DEF$, $m\angle F = 38^\circ$ and $m\angle D = 30^\circ$. Are the triangles similar? Justify your reasoning.

Answer: Yes, the triangles are similar by AA Similarity

2. Triangles LMN and OPQ are shown below.

What additional information is sufficient to show that $\triangle LMN$ can be transformed and mapped onto $\triangle OPQ$?

- A. $OQ = 6$
- B. $MN = 9$
- C. $\angle LMN \cong \angle QOP$
- D. $\angle NLM \cong \angle QOP$



Answer: D

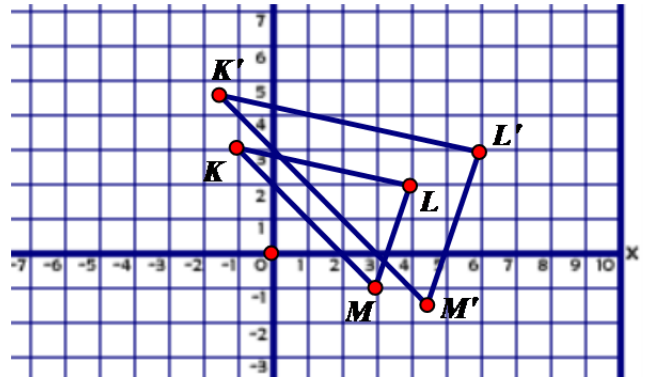
3. Which of the following is not a similarity transformation?

- A) Translation
- B) Dilation
- C) Rotation
- D) Stretch

Answer: D

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4. Triangle KLM is the pre-image of $\Delta K'L'M'$, before a transformation.



Which statements are true?

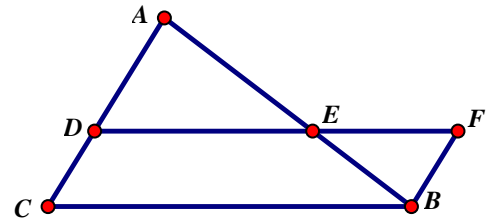
Select **ALL** that apply.

- A. Triangle KLM is similar to $\Delta K'L'M'$.
- B. Triangle KLM is not similar to $\Delta K'L'M'$.
- C. There is a dilation of scale factor 0.5 centered at the origin.
- D. There is a dilation of scale factor 1 centered at the origin.
- E. There is a dilation of scale factor 1.5 centered at the origin.
- F. There was translation left 0.5 and up 1.5.
- G. There was a translation left 1.5 and up 0.5.

Answer: A and E

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5. Given that DFBC is a parallelogram, determine which sequence of similarity transformations proves that $\triangle BEF \sim \triangle AED$.



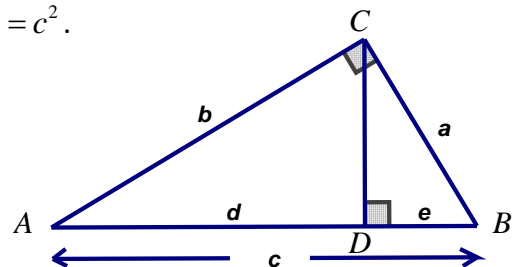
- A. a dilation about E by a scale factor of $\frac{AE}{BE}$ followed by a rotation of 180° about point E maps $\triangle AED$ onto $\triangle BEF$.
- B. a dilation about E by a scale factor of $\frac{BE}{AE}$ followed by a rotation of 180° about point E maps $\triangle BEF$ onto $\triangle AED$.
- C. a dilation about E by a scale factor of $\frac{AE}{BE}$ followed by a rotation of 180° about point E maps $\triangle BEF$ onto $\triangle AED$.
- D. a rotation of 180° about point E followed by a dilation about E by a scale factor of $\frac{BE}{AE}$ maps $\triangle BEF$ onto $\triangle AED$.

Answer: C

G-SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

1. In the diagram, $\triangle ABC$ is a right triangle with right angle C , and \overline{CD} is an altitude of $\triangle ABC$.

Use the fact that $\triangle ABC \sim \triangle ACD \sim \triangle CBD$ to prove $a^2 + b^2 = c^2$.



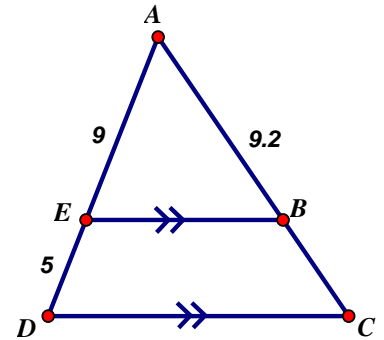
Answer: See the last page of this document.

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2. In the diagram of $\triangle ADC$ to the right, $\overline{EB} \parallel \overline{DC}$, $AE = 9$, $ED = 5$, and $AB = 9.2$.

What is the length of \overline{AC} to the nearest tenth?

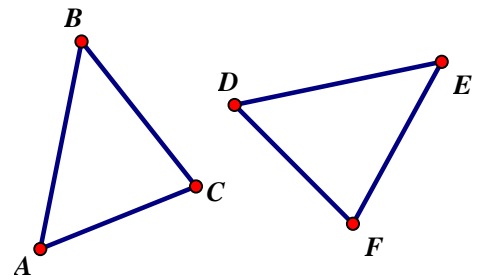
- A. 5.1 B. 5.2 C. 14.3 D. 14.4



Answer: C

3. Which statement is sufficient evidence that $\triangle DEF$ is congruent to $\triangle ABC$?

- A. $AB = DE$ and $BC = EF$
B. $\angle D \cong \angle A$, $\angle B \cong \angle E$, $\angle C \cong \angle F$
C. There is a sequence of rigid motions that maps \overline{AB} onto \overline{DE} , \overline{BC} onto \overline{EF} , and \overline{AC} onto \overline{DF} .
D. There is sequence of rigid motions that maps point A onto D , \overline{AB} onto \overline{DE} , and $\angle B$ onto $\angle E$.



Answer: C

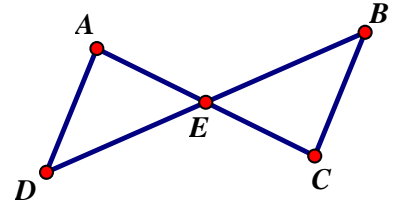
4. Sally constructs a triangle where two of the angles measure 50° and 60° . Tom constructs a triangle where two of the angles measure 50° and 70° . What is true about the two triangles?

- A. The triangles cannot be similar.
B. The triangles could be similar.
C. The triangles must be similar.

Answer: C

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5. Given: \overline{AC} and \overline{BD} bisect each other.



Part A:

Which condition makes $\triangle AED \cong \triangle CEB$?

- A. $\angle AED \cong \angle CEB$
- B. $\angle EAD \cong \angle ECB$
- C. $\angle EDA \cong \angle ECB$
- D. $\angle DEC \cong \angle BEA$

Part B:

When the condition selected in Part A is true, which triangle congruence criteria is met?

- A. Side – Side – Side
- B. Side – Angle – Side
- C. Angle – Side – Angle
- D. Angle – Angle – Side

Answer: Part A: A, Part B: B

6. Quadrilateral $ABCD$ with diagonal \overline{BD} , has $\overline{AB} \cong \overline{CD}$.

Part A:

Which condition would make $\triangle ABD \cong \triangle CDB$?

- A. $\angle C \cong \angle A$
- B. $\overline{AB} \parallel \overline{CD}$
- C. $\overline{AD} \parallel \overline{CB}$
- D. $\overline{AB} \perp \overline{BC}$

Part B:

When the condition in Part 1 is true, which triangle congruence criterion is met?

- A. Side – Side – Side
- B. Side – Angle – Side
- C. Angle – Side – Angle
- D. Angle – Angle – Side

Answer: Part A: B, Part B: B

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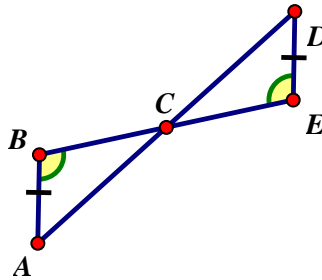
7. Provide the missing reasons in the proof.

GIVEN:

$$\overline{AB} \cong \overline{ED} \text{ \& } \angle B \cong \angle D$$

PROVE:

$$\triangle ABC \cong \triangle DEC$$



STATEMENT	REASON
1. $\angle B \cong \angle D$	1. GIVEN
2. $\angle BCA \cong \angle ECD$	2. _____
3. $\overline{AB} \cong \overline{ED}$	3. GIVEN
4. $\triangle ABC \cong \triangle DEC$	4. _____

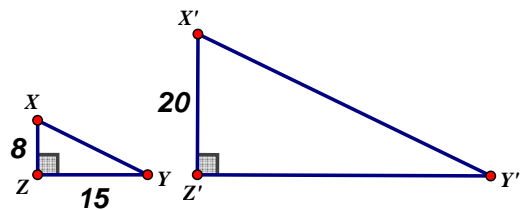
Answer: 2. Vertical $\angle \cong$

4. AAS

8. A composition of transformations is performed on triangle XYZ resulting in triangle $X'Y'Z'$ such that:

Perimeter of $\triangle XYZ$ is 40

Perimeter of $\triangle X'Y'Z'$ is 100



$$X'Z' = 20 \quad YZ = 15$$

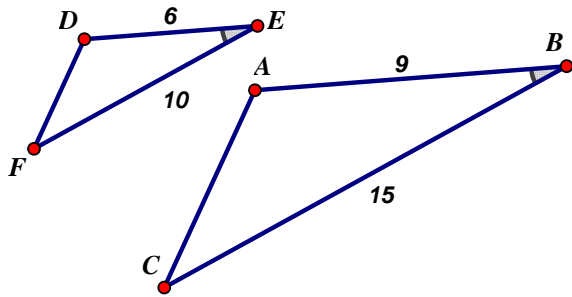
Which transformation must have occurred and why?

Determine XY and $Y'Z'$.

Answer: Dilation, perimeter scale factor is 2.5, $XY = 17$, $X'Y' = 37.5$

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9. Triangles ABC and DEF are drawn below:



If $AB = 9$, $BC = 15$, $DE = 6$, $EF = 10$, and $\angle B \cong \angle E$, which statement is true?

- A. $\angle CAB \cong \angle DEF$ B. $\frac{AB}{CB} = \frac{FE}{DE}$ C. $\triangle ABC \sim \triangle DEF$ D. $\frac{AB}{DE} = \frac{FE}{CB}$

Answer: C

G-SRT.C.7 Explain and use the relationship between the sine and cosine of complementary angles.

1. If $\sin 35^\circ \approx 0.5736$, then $\cos 55^\circ \approx$ _____.

Answer: 0.5736

2. In right triangle ABC with the right angle at C , $\sin A = (2x + 0.1)$ and $\cos B = (4x - 0.7)$. Determine the value of x .

Answer: 0.4

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3. The degree measure of an angle in a right triangle is x , and $\sin x = \frac{1}{3}$. Which of these expressions are also equal to $\frac{1}{3}$?

- A. $\cos(x)$ B. $\cos(x - 45^\circ)$ C. $\sin(90^\circ - x)$ D. $\cos(60^\circ - x)$ E. $\cos(90^\circ - x)$

Answer: E

4. Let $\cos A = m$. What is the value of $\sin A$?

- A. \sqrt{m} B. $1 - m$ C. $\sqrt{1 - m}$ D. $\sqrt{1 - m^2}$

Answer: D

G-SRT.C.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.*

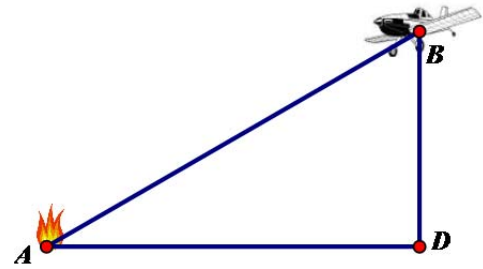
1. Regina is designing an outdoor art exhibit. She needs a metal equilateral triangle that measures 40 inches on each side. She wants to cut the triangle from a rectangular piece of metal that is 40 inches long. What is the minimum width of the rectangle Regina needs to be able to cut out the triangle?

- A. $\frac{20\sqrt{3}}{3}$ inches B. $20\sqrt{3}$ inches C. $20\sqrt{2}$ inches D. 40 inches

Answer: B

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2. An unmanned aerial vehicle (UAV) is equipped with cameras used to monitor forest fires. The figure represents a moment in time at which a UAV, at point B , flying at an altitude of 1,000 meters (m) is directly above point D on the forest floor. Point A represents the location of a small fire on the forest floor.



At the moment in time represented by the figure, the angle of depression from the UAV to the fire has a measure of 30° .

Part A:

At the moment in time represented by the figure, what is the distance from the UAV to the fire?

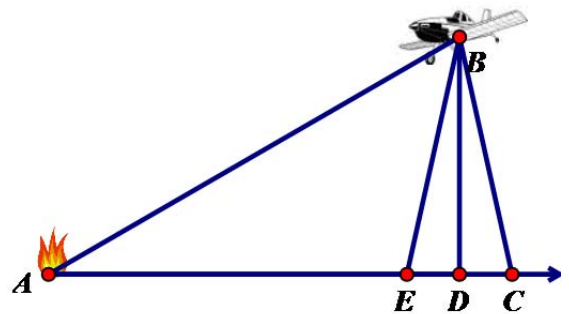
Part B:

What is the distance, to the nearest meter, from the fire to point D ?

Part C:

Points C and E represent the linear range of view of the camera when it is pointed directly down at point D .

The field of view of the camera is 20° and is represented in the figure by $\angle CBE$. If the camera takes a picture directly over point D , what is the approximate width of the forest floor that will be captured in the picture?

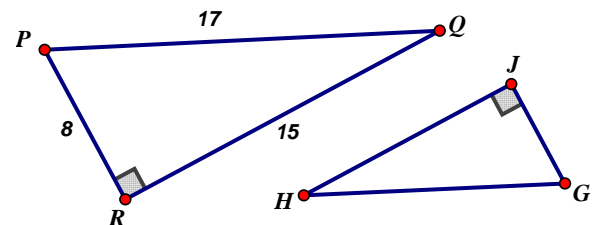


- | | |
|---------------|---------------|
| A. 170 meters | B. 353 meters |
| C. 364 meters | D. 728 meters |

Answer: Part A: 2000 m, Part B: 1732 m, Part C: B

3. Given that $\triangle GHJ \sim \triangle PQR$, determine which ratio represents $\tan H$?

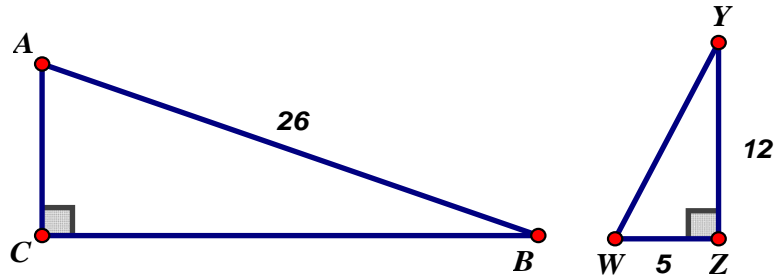
- | | | | |
|-------------------|-------------------|-------------------|-------------------|
| A. $\frac{8}{15}$ | B. $\frac{8}{17}$ | C. $\frac{15}{8}$ | D. $\frac{17}{8}$ |
|-------------------|-------------------|-------------------|-------------------|



Answer: A

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4. Given that $\triangle ABC \sim \triangle WYZ$, determine whether each statement is true. Select **True** or **False** for each statement.

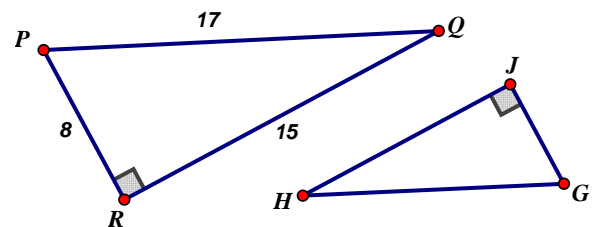


$\sin A < \sin Y$	True or False
$\cos B = \sin W$	True or False
$\tan W > \tan A$	True or False

Answer: False, True, False

5. Given that $\triangle GHJ \sim \triangle PQR$, determine which ratio represents $\tan H$?

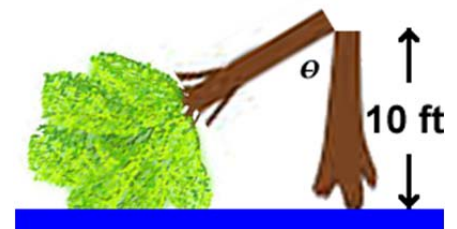
- A. $\frac{8}{15}$ B. $\frac{8}{17}$ C. $\frac{15}{8}$ D. $\frac{17}{8}$



Answer: A

6. A 28 foot tree along the river bank is cut 10 feet above ground. The top of the tree stays attached but crashes to the ground forming the diagramed position. What is the approximate angle measure formed between the two tree pieces?

- A. 69° B. 56° C. 34° D. 21°



Answer: B

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7. A blue bird sitting in its nest at the top of a tree spots a large red apple in Janice's hands at an angle of depression of 15° . If Janice is 53 ft from the tree and the apple is 4 ft off the ground, how high is the bird off the ground? (2 decimal places)



Answer: $\tan 15^\circ = \frac{x}{53}$ $x = 14.20 + 4 = 18.20 \text{ ft}$

8. Bob uses a 20 foot ladder to paint a section of his house that is 16 feet high.

Select **ALL** equations that can be used to solve for θ .

A. $\sin \theta = \frac{12}{20}$

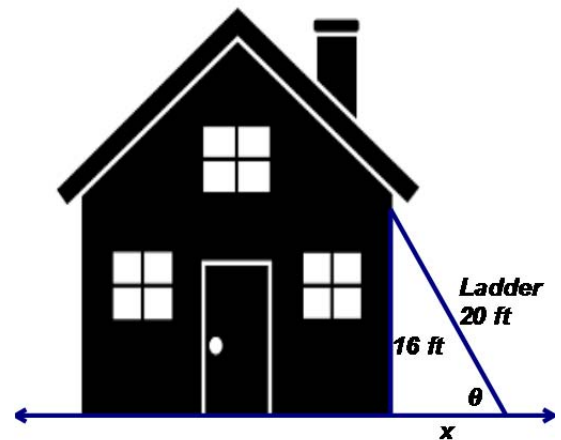
B. $\cos \theta = \frac{12}{20}$

C. $\tan \theta = \frac{12}{20}$

D. $\sin \theta = \frac{16}{20}$

E. $\cos \theta = \frac{16}{20}$

F. $\tan \theta = \frac{16}{20}$



Answer: B and D

Answer to Problem #1 from G-SRT.B.5:

Statement	Reason
1. $\angle BDC \cong \angle BCA$	1. all right angles are congruent.
2. $\angle B \cong \angle B$	2. Reflexive property
3. $\triangle BDC \sim \triangle BCA$	3. AA Similarity
4. $\angle ADC \cong \angle ACB$	4. all right angles are congruent.
5. $\angle A \cong \angle A$	5. Reflexive property
6. $\triangle ADC \sim \triangle ACB$	6. AA similarity
7. $\frac{a}{c} = \frac{e}{a}$ and $\frac{b}{c} = \frac{d}{b}$	7. Corresponding sides of similar triangles are proportional
8. $a^2 = ce$ and $b^2 = cd$	8. cross product property
9. $a^2 + b^2 = ce + cd$	9. Addition property
10. $a^2 + b^2 = c(e + d)$	10. Factor
11. $e + d = \frac{a^2 + b^2}{c}$	11. Segment Addition Postulate
12. $a^2 + b^2 = c^2$	12. Substitution and multiplication prop.