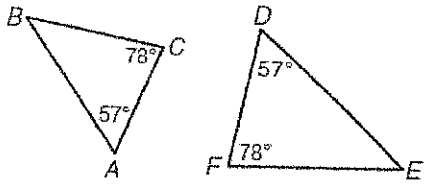
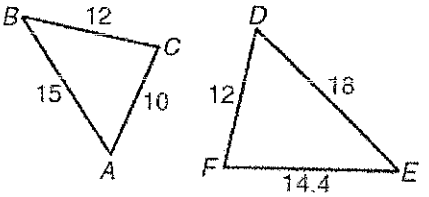
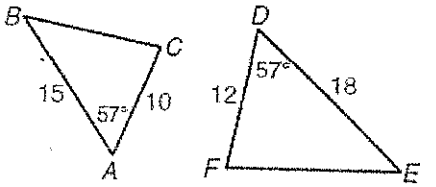
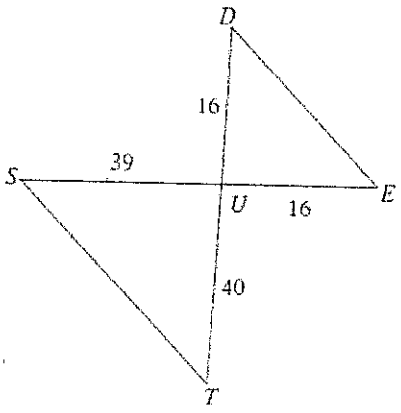
Name: _____ Date: _____

Triangle Similarity Shortcuts

Angle-Angle (AA) Similarity	If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.	 $\triangle ABC \sim \triangle DEF$
Side-Side-Side (SSS) Similarity	If the three sides of one triangle are proportional to the three corresponding sides of another triangle, then the triangles are similar.	 $\triangle ABC \sim \triangle DEF$
Side-Angle-Side (SAS) Similarity	If two sides of one triangle are proportional to two sides of another triangle and their included angles are congruent, then the triangles are similar.	 $\triangle ABC \sim \triangle DEF$

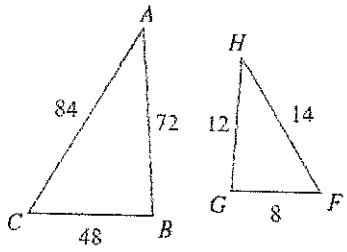
State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

1)



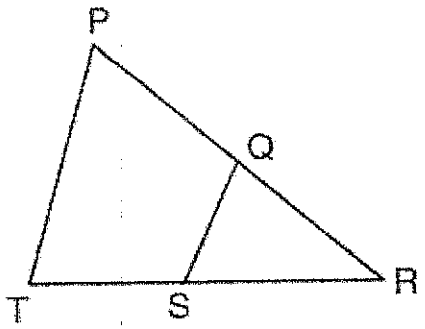
$\triangle UTS \sim$ _____

2)



$\triangle CBA \sim$ _____

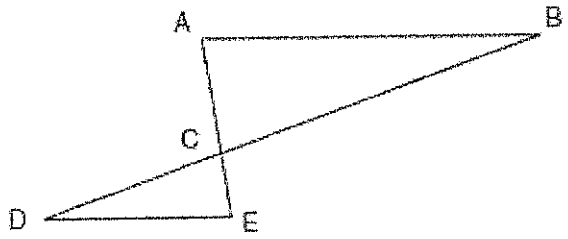
3. In the diagram below of ΔPRT, Q is a point on $\overline{PR}$, S is a point on $\overline{TR}$, $\overline{QS}$ is drawn, and $\angle RPT \cong \angle RSQ$.



Which reason justifies the conclusion that $\Delta PRT \sim \Delta SRQ$?

1) AA
2) ASA
3) SAS
4) SSS

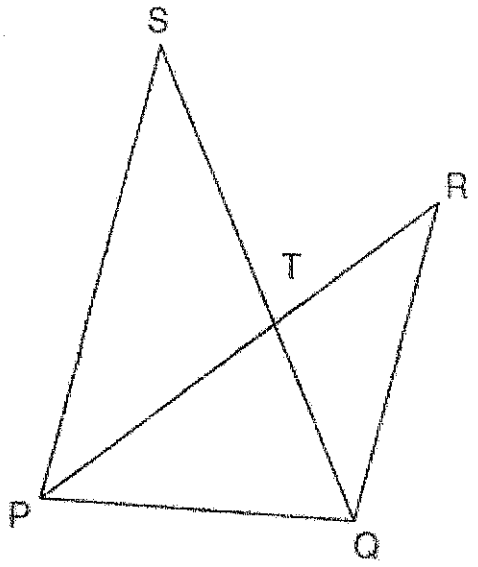
4. In the diagram of ΔABC and ΔEDC below, $\overline{AE}$ and $\overline{BD}$ intersect at C, and $\angle CAB \cong \angle CED$.



Which method can be used to show that ΔABC must be similar to ΔEDC?

1) SAS
2) AA
3) SSS
4) HL

. In the diagram below, $\overline{SQ}$ and $\overline{PR}$ intersect at T, $\overline{PQ}$ is drawn, and $\overline{PS} \parallel \overline{QR}$.



What technique can be used to prove that $\Delta PST \sim \Delta RQT$?

1) SAS
2) SSS
3) ASA
4) AA

6. In triangles *ABC* and *DEF*, $AB = 4$, $AC = 5$, $DE = 8$, $DF = 10$, and $\angle A \cong \angle D$. Which method could be used to prove $\Delta ABC \sim \Delta DEF$?

1) AA

2) SAS

3) SSS

4) ASA

7. In $\triangle ABC$ and $\triangle DEF$, $\frac{AC}{DF} = \frac{CB}{FE}$. Which additional information would prove $\triangle ABC \sim \triangle DEF$?

1) $AC = DF$

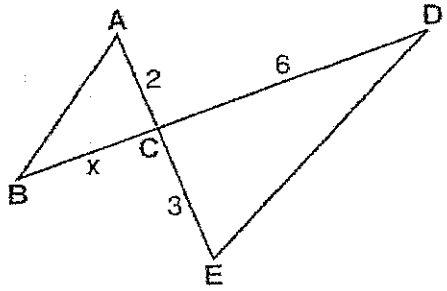
2) $CB = FE$

3) $\angle ACB \cong \angle DFE$

4) $\angle BAC \cong \angle EDF$

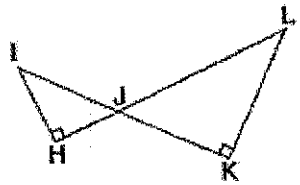
8.

In the accompanying diagram, $\overline{ACE}$, $\overline{BCD}$, and $\overline{AB} \parallel \overline{DE}$. If $AC = 2$, $CD = 6$, and $CE = 3$, what is the length of $\overline{BC}$.



9.

In the accompanying diagram, $\triangle IHJ \sim \triangle LKJ$.



If $IH = 5$, $HJ = 2$, and $LK = 7$, find KJ.

10.

Complete the following when $\Delta IJK \sim \Delta LMN$.

a) $m\angle K = m\angle$ _____

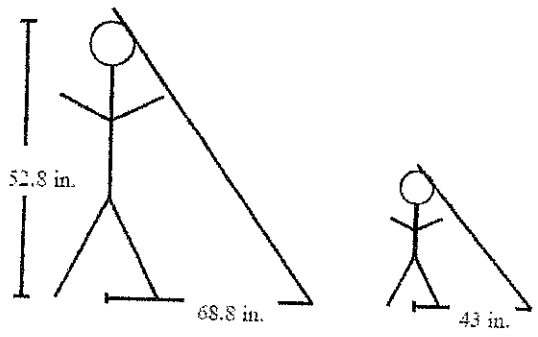
b) $\frac{KI}{JI} = \frac{NL}{?}$

11.

In ΔQRS, $QR=7$, $RS=13$, and $m\angle R=46$. In ΔUVT, $VT=14$, $TU=28$, and $m\angle T=46$. State whether the triangles are similar, and if so, write a similarity statement.

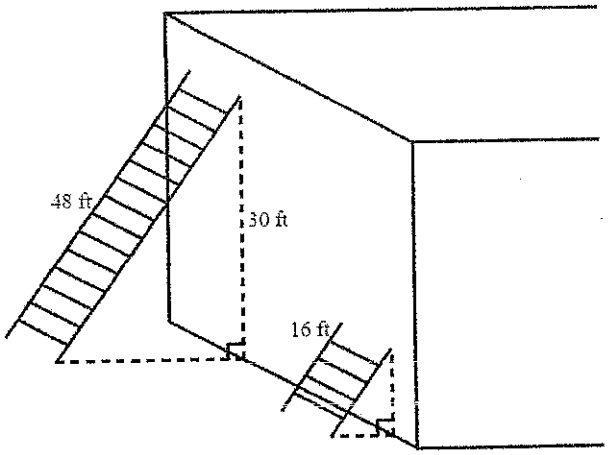
12.

At the same time of day, a man who is 52.8 inches tall casts a 68.8-inch shadow and his son casts a 43-inch shadow. What is the height of the man's son?



13.

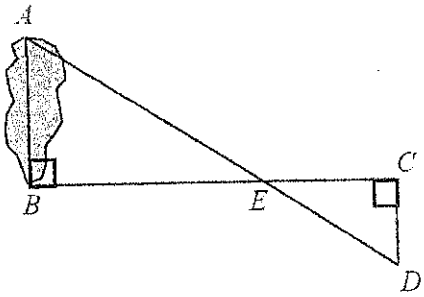
Two ladders are leaning against a wall at the same angle as shown. How far up the wall does the shorter ladder reach?



[A] 8 ft [B] 10 ft [C] 6 ft [D] 20 ft

14.

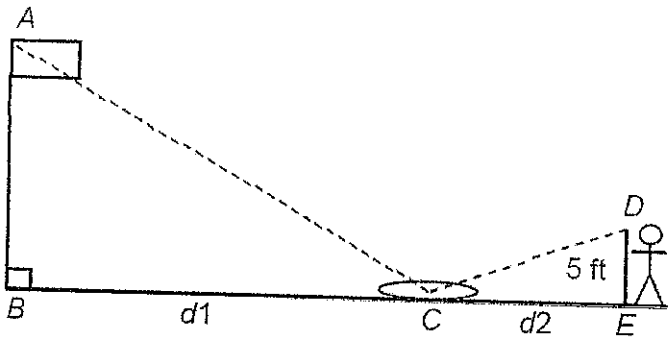
To find the distance across the lake in the figure below, which of the following proportions can you use?



[A] $\frac{BE}{CE} = \frac{AB}{CD}$ [B] $\frac{BE}{EC} = \frac{CD}{AB}$ [C] $\frac{AB}{BE} = \frac{CD}{DE}$ [D] $\frac{AB}{AE} = \frac{DE}{CD}$

15.

Karen wanted to measure the height of her school's flag pole. She placed a mirror on the ground $d1$ feet from the flag pole, then walked backwards until she was able to see the top of the pole in the mirror. Her eyes were 5 ft above the ground and she was $d2$ ft from the mirror. Using similar triangles, find the height of the flagpole if $d1 = 42$ ft and $d2 = 8$ ft. Round your answer to the nearest hundredth.

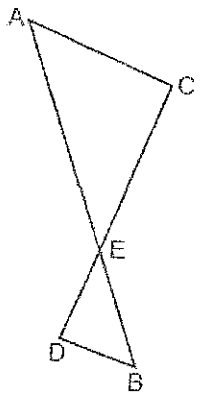


16.

In ΔQRS, $QR=7$, $RS=13$, and $m\angle R=46$. In ΔUVT, $VT=14$, $TU=28$, and $m\angle T=46$. State whether the triangles are similar, and if so, write a similarity statement.

17.

As shown in the diagram below, $\overline{AB}$ and $\overline{CD}$ intersect at E, and $\overline{AC} \parallel \overline{BD}$.



Given $\triangle AEC \sim \triangle BED$, which equation is true?

(1) $\frac{CE}{DE} = \frac{EB}{EA}$

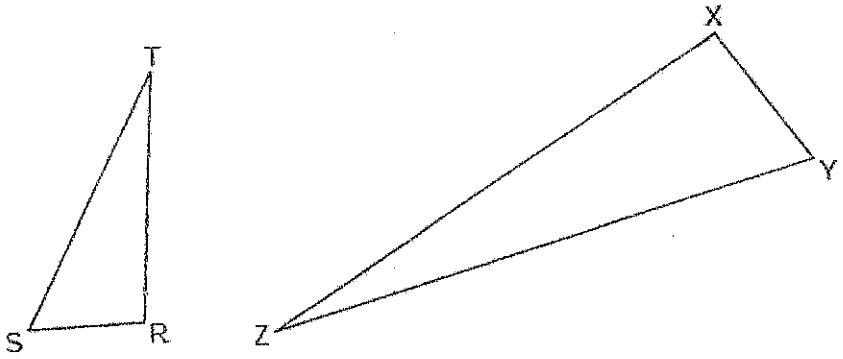
(2) $\frac{AE}{BE} = \frac{AC}{BD}$

(3) $\frac{EC}{AE} = \frac{BE}{ED}$

(4) $\frac{ED}{EC} = \frac{AC}{BD}$

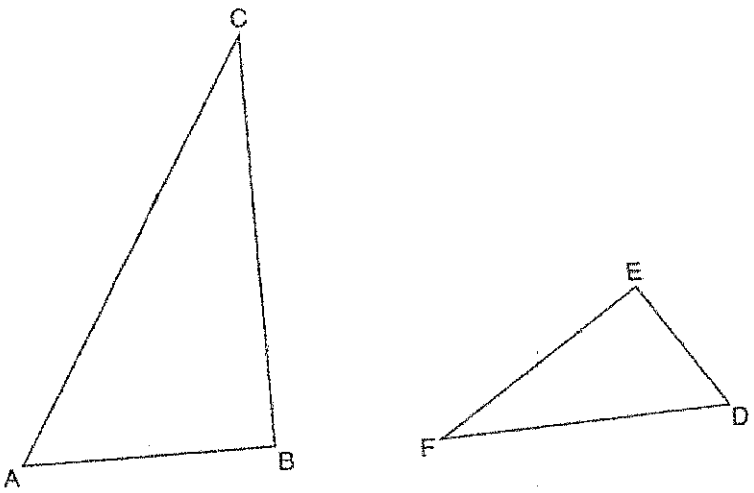
18.

Triangles RST and XYZ are drawn below. If $RS = 6$, $ST = 14$, $XY = 9$, $YZ = 21$, and $\angle S \cong \angle Y$, is $\triangle RST$ similar to $\triangle XYZ$? Justify your answer.



19.

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?

(1) $\angle CAB \cong \angle DEF$

(2) $\frac{AB}{CB} = \frac{FE}{DE}$

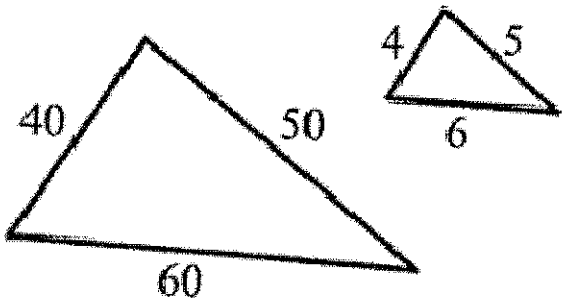
(3) $\triangle ABC \sim \triangle DEF$

(4) $\frac{AB}{DE} = \frac{FE}{CB}$

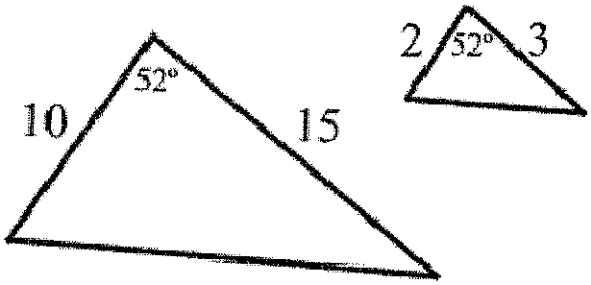
Choose:

- AA
- SSS
- SAS
- not similar

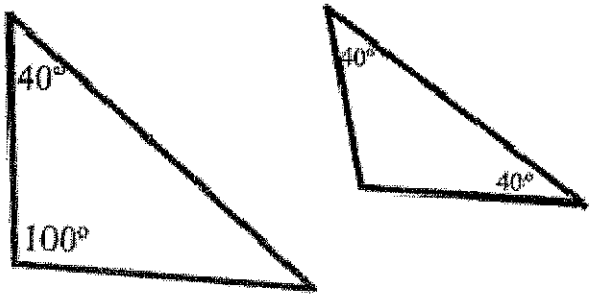
1) As marked, by which method would it be possible to prove these triangles similar (if possible)?



2) As marked, by which method would it be possible to prove these triangles similar (if possible)?



3) As marked, by which method would it be possible to prove these triangles similar (if possible)?

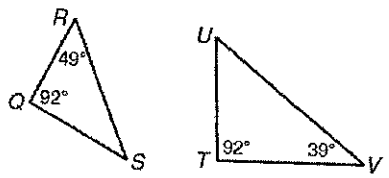


Name: _____ Date: ____

Similarity Homework

Explain how you know the triangles are similar, and write a similarity statement.

1.



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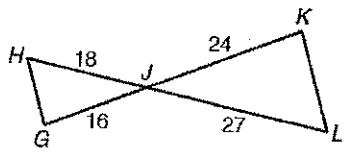
2.



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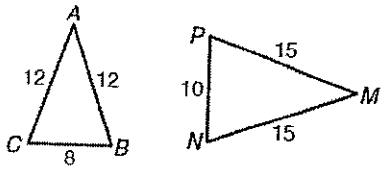
3. Verify that $\triangle ABC \sim \triangle MNP$.



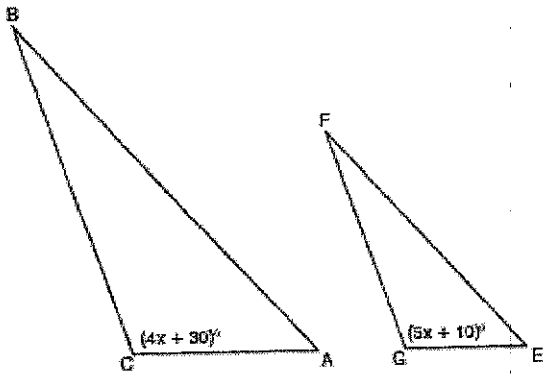
_____

_____

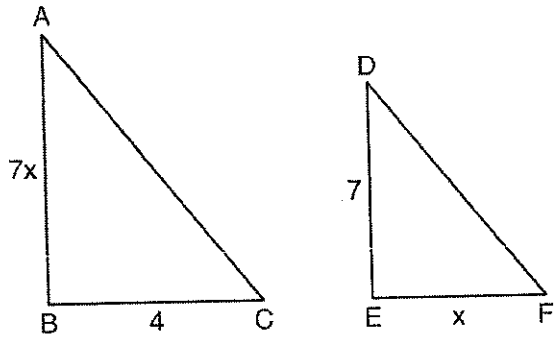
4. If $\Delta ABC \sim \Delta ZXY$, $m\angle A = 50$, and $m\angle C = 30$, what is $m\angle X$?

5. In the diagram below, $\Delta ABC \sim \Delta EFG$, $m\angle C = 4x + 30$, and $m\angle G = 5x + 10$.

Determine the value of *x*.

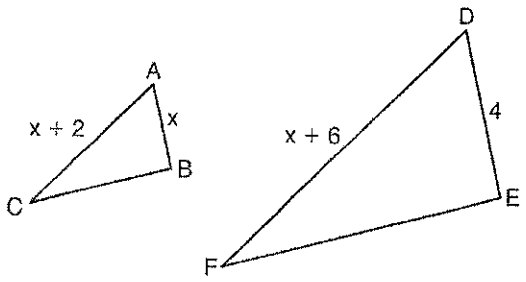


6. As shown in the diagram below, $\Delta ABC \sim \Delta DEF$, $AB = 7x$, $BC = 4$, $DE = 7$, and $EF = x$.



What is the length of $\overline{AB}$?

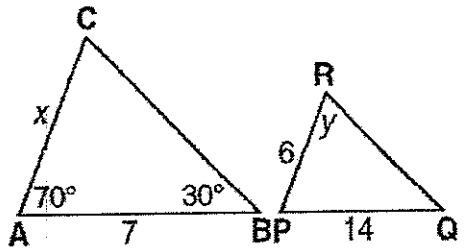
7. In the diagram below, $\Delta ABC \sim \Delta DEF$, $DE = 4$, $AB = x$, $AC = x + 2$, and $DF = x + 6$. Determine the length of $\overline{AB}$. [Only an algebraic solution can receive full credit.]



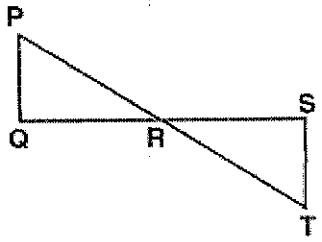
8. Under a dilation with respect to the origin, the image of $P(-15,6)$ is $P'(-5,2)$. What is the constant of dilation?

9.

If $\Delta ABC \sim \Delta PQR$, find the value of x and y.



10.



Given: $\overline{PT}$ bisects $\overline{QS}$
$\overline{PQ} \perp \overline{QS}$
$\overline{TS} \perp \overline{QS}$

Prove by any method: $\Delta PQR \cong \Delta TSR$