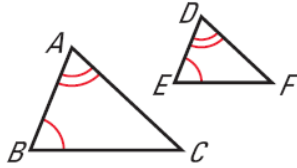**Section 6.5– Proving Triangles are Similar Using the 3 Shortcuts**

In the previous lesson, we learned that two figures are similar if **1)** the _____ of corresponding sides

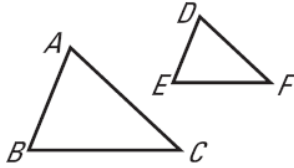are _____ and **2)** the corresponding _____ are congruent.

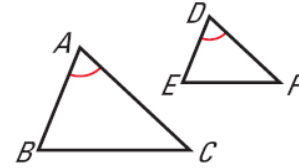Now we will learn ____ _____ for proving two triangles are similar.

AA Similarity Postulate	SSS Similarity Theorem	SAS Similarity Theorem

If $\angle A \cong \angle D$ and $\angle B \cong \angle E$, then $\triangle ABC \sim \triangle DEF$.

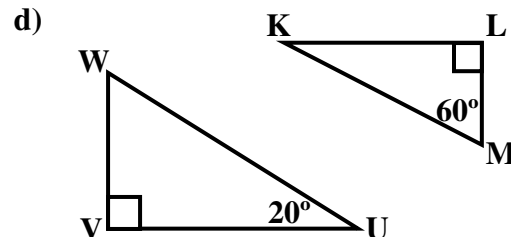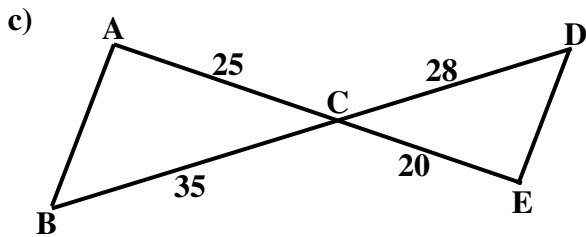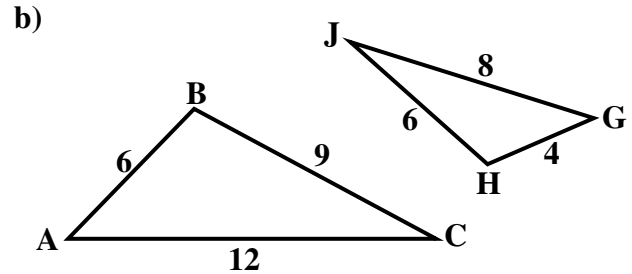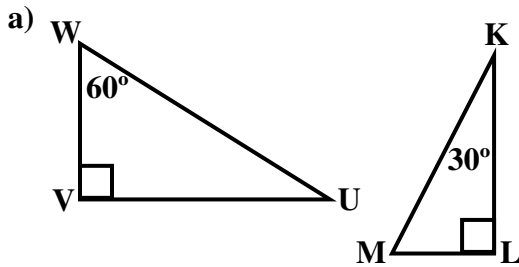If $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$, then $\triangle ABC \sim \triangle DEF$.

If $\angle A \cong \angle D$ and $\frac{AB}{DE} = \frac{AC}{DF}$ then $\triangle ABC \sim \triangle DEF$.

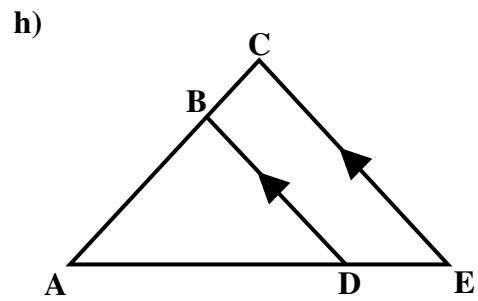**Important:** The S has a different meaning with similarity shortcuts as opposed to congruence shortcuts.
          With congruence, the S's meant that corresponding sides are congruent, but
          with <u>similarity</u>, the S's mean that the <u>ratios</u> of the corresponding <u>sides</u> are <u>equal</u>.

Ex 1:
Determine whether the triangles can be proved similar. If they are, provide a reason by stating a shortcut.
Otherwise, state why the triangles are not similar.
Important: Depending on how you approach the problem, sometimes a different shortcut can be used.

a)

b)

c)

d)

e)

S
6
O
12
Y   7   X   14   W

f) V   15   U
8
T   9   S
12
R

g)

C
B
A   D   E

h)

C
B
A   D   E

i)

M
N 71°   O

P   Q
38°
R

j)

E
12
D
6
A   B   C
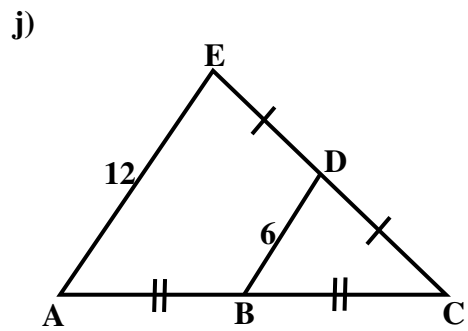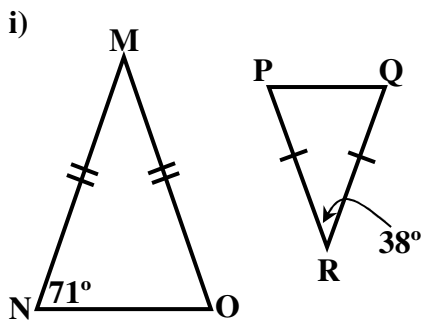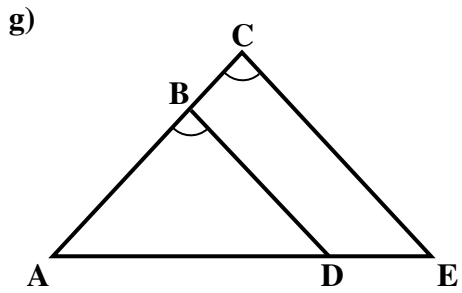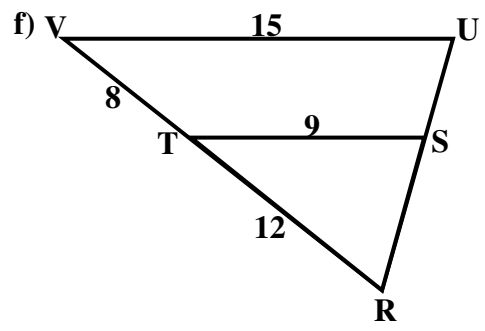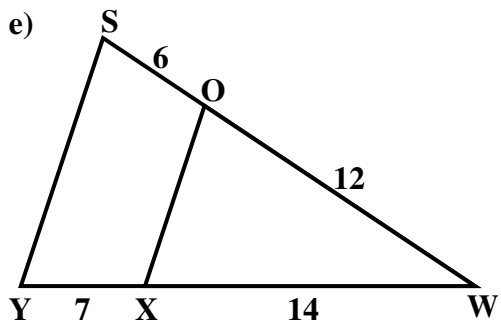
Ex 2:
Separate Shadows and Similar Triangles Parallel sun ray's hit a clock tower and stick creating shadows. A student uses the measurements shown in the figure.
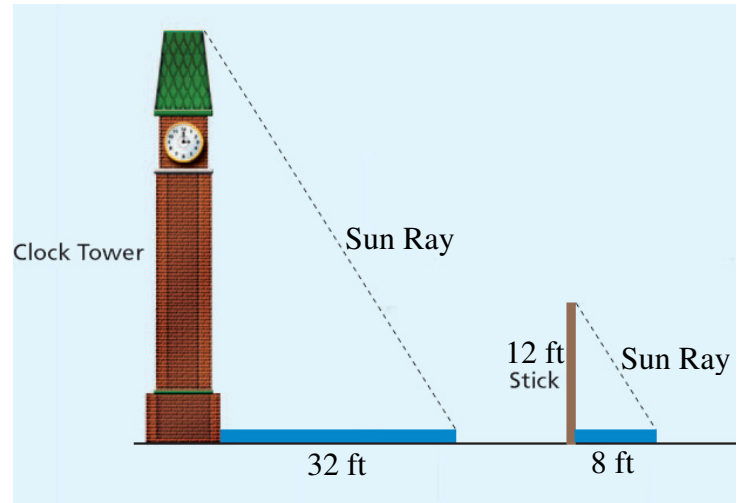**a)** What shortcut can be used to show that the two triangles are similar?

b) What is the height of the clock tower.

Clock Tower

Sun Ray

12 ft
Stick

Sun Ray

32 ft

8 ft

Ex 3:
Overlapping Shadows and Similar Triangles A painter is preparing an estimate to paint a building. To approximate the building's height, he stands so that the top of his shadow coincides (overlaps) with that of the building. The painter uses the measurements shown in the figure.
a) What shortcut can be used to show that the triangles are similar?

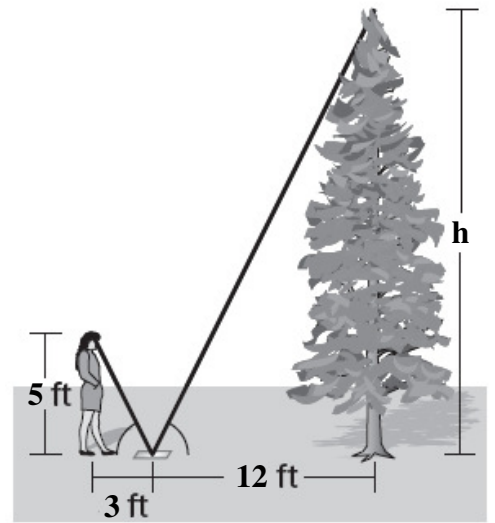**b)** What is the approximate height of the building?

6 ft

2 ft

14 ft
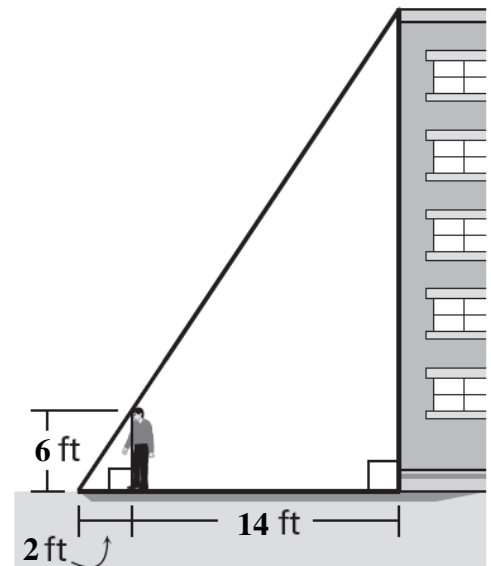
Ex 4:

Mirror and Similar Triangles In order to estimate the height of a tall pine tree, a student places a mirror on the ground and stands where she can see the top of the tree, as shown.

a) What shortcut can be used to show that the triangles are similar?

b) What is the height of the pine tree?

5 ft

h

3 ft

12 ft

Ex 5:

Landmarks and Similar Triangles A student places three stakes (Wooden Poles) and uses two trees to determine the width of a river. The distance between stake 1 and stake 2 is 80 ft. The distance between Stake 1 and Stake 3 is 120 ft. The distance between the trees is 160 ft.

a) What shortcut can be used to show that the triangles are similar?

b) What is the width of the river?

Tree 1

Tree 2

160 ft

80 ft

Stake 1

Stake 2

120 ft

Stake 3