Geometry

Notes Section 6.4

Prove Triangles Similar by SSS and SAS

THEOREM 6.2 Side-Side-Side (SSS) Similarity Theorem

If the corresponding side lengths of
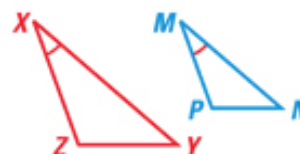two triangles are proportional, then
the triangles are similar.

If $\dfrac{AB}{RS} = \dfrac{BC}{ST} = \dfrac{CA}{TR}$, then $\triangle ABC \sim \triangle RST$.
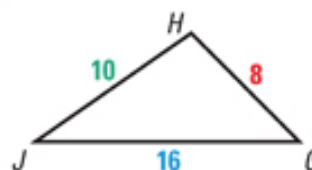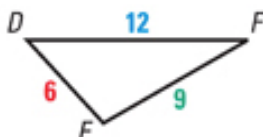

THEOREM 6.3 Side-Angle-Side (SAS) Similarity Theorem

If an angle of one triangle is congruent to an angle
of a second triangle and the lengths of the sides
including these angles are proportional, then the
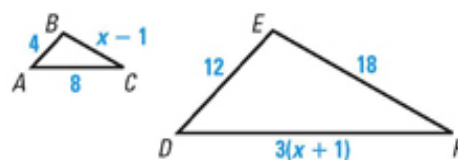triangles are similar.

If $\angle X \cong \angle M$ and $\dfrac{ZX}{PM} = \dfrac{XY}{MN}$, then $\triangle XYZ \sim \triangle MNP$.
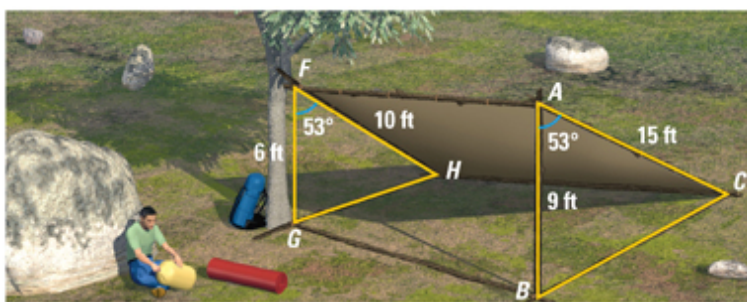

EXAMPLE 1   Is either ΔDEF or ΔGHJ similar to ΔABC?

EXAMPLE 2   Find the value of x that makes ΔABC ~ ΔDEF.

$$B \quad x - 1$$
$$4 \qquad 12 \qquad 18$$
$$A \quad 8 \quad C$$
$$D \quad 3(x + 1) \quad F$$

EXAMPLE 3   You are building a lean-to shelter starting from a tree branch. Can you construct the right end so it is similar to the left end using the angle measure and lengths shown?

F
53°   10 ft
6 ft   H
G

A
53°   15 ft
9 ft
C
B

EXAMPLE 4   Tell what method you would use to show that the triangles are similar?

a)

A   18   C   15   E
B   9   30   D

b)

X
20   12   15
W   16   Z   9   Y