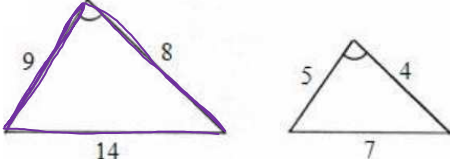
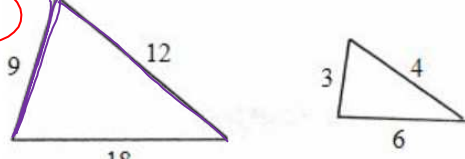
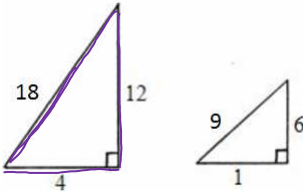


CODE RED – DO NOW

Which of the following pairs of triangles are similar?

~~a)~~  ~~b)~~ 

$\frac{9}{5} = \frac{9}{5}$ $\frac{8}{4} = \frac{2}{1}$ $\frac{14}{7} = \frac{2}{1}$ $\frac{9}{3} = \frac{3}{1}$ $\frac{12}{4} = \frac{3}{1}$ $\frac{18}{6} = \frac{3}{1}$

~~c)~~  $\frac{18}{9} = \frac{2}{1}$ $\frac{12}{6} = \frac{2}{1}$ $\frac{4}{1} = \frac{4}{1}$

Proving Triangles Similar

SOL G.7

Learning Target: By the end of class today, I will be able to prove that two triangles are similar by SSS~, AA~, or SAS~, as evidenced by scoring at least 75% (3 out of 4) on the class exit ticket.

Essential Questions:

- How do you use proportions to find side lengths in similar polygons?
- How can you prove two triangles are similar?

Today's Agenda

- ✓ DO NOW
- ✓ Scale Factor and Similar Figures
- ✓ SSS~, AA~, SAS~
- ✓ Proving Triangles Similar
- ✓ KAHOOT!!
- ✓ Exit Ticket

CODE YELLOW

Vocabulary

A **RATIO** is a comparison of two terms that can be presented three different ways: $\frac{a}{b}$, a:b, or "a to b"

$$\frac{a}{b} \times \frac{c}{d}$$

A **PROPORTION** is an equation stating two ratios are equal.

To solve a proportion, you **CROSS-MULTIPLY** to find the **CROSS PRODUCT**

The **Scale Factor** is the ratio of the sizes of two similar shapes

CODE YELLOW

Similar Figures:

Figures that are similar have the same shape but not the same size.



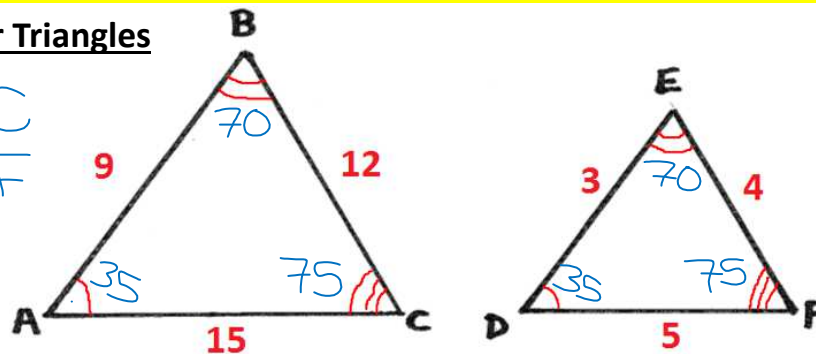
$\Delta 1$ is similar to $\Delta 2$ ($\Delta 1 \sim \Delta 2$). $\Delta 1$ is not similar to $\Delta 3$ ($\Delta 1 \not\sim \Delta 3$).

- the angle measures are congruent
- the side lengths are proportional

CODE YELLOW

Similar Triangles

ABC
DEF



Similarity Statement

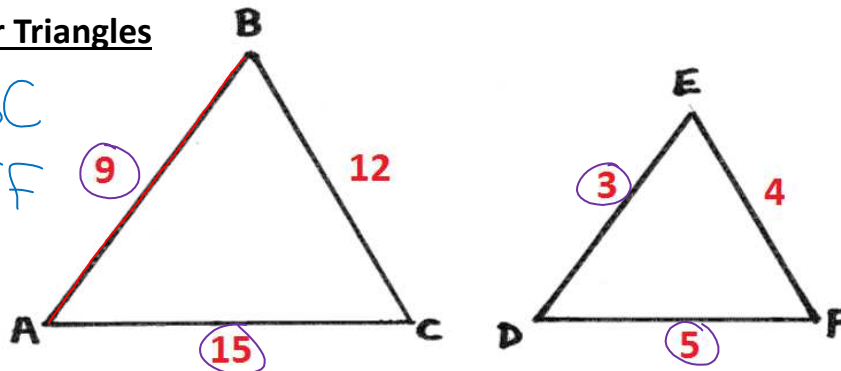
$$\underline{\triangle ABC} \sim \underline{\triangle DEF}$$

Corresponding angles are congruent

CODE YELLOW

Similar Triangles

ABC
DEF



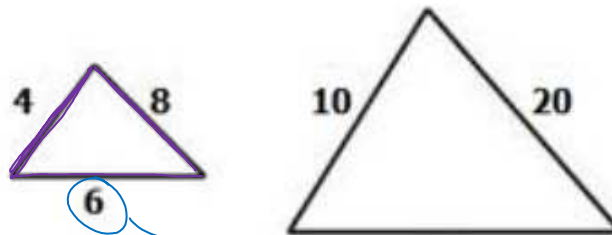
Ratios:

$$\frac{AB}{DE} = \frac{9}{3} = \frac{BC}{EF} = \frac{12}{4} = \frac{AC}{DF} = \frac{15}{5}$$

Corresponding Sides are proportional

CODE YELLOW

The Scale Factor is the ratio of the sizes of two similar shapes



Scale Factor:

$$\frac{4}{10} = \frac{2}{5}$$

$$\frac{8}{20} = \frac{2}{5}$$

$$\frac{6}{x} = \frac{2}{5}$$

$$2x = 6 \times 5$$

$$2x = 30$$

$$x = 15$$

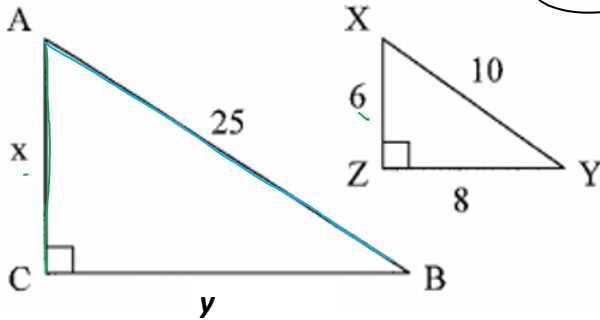
CODE YELLOW

Find the scale factor and the value of x and y .

ABC
XYZ

$\Delta ABC \sim \Delta XYZ$

$$\frac{25}{10} = \frac{5}{2} \rightarrow \text{scale factor}$$



$$\frac{x}{6} = \frac{5}{2} \quad (x=15)$$

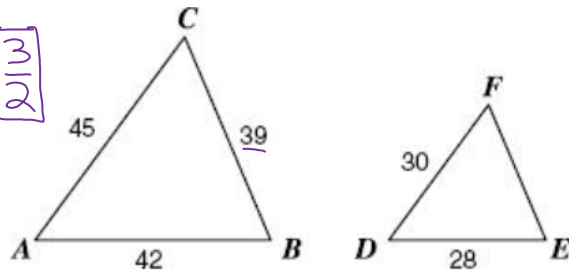
$$\frac{8}{y} = \frac{5}{2} \quad (y=20)$$

CODE YELLOW

What is the scale factor if $\Delta ABC \sim \Delta DEF$?

ABC
DEF

$$\frac{AB}{DE} = \frac{42}{28} = \frac{3}{2}$$



What is the value of x ?

$$\frac{3}{2} \times \frac{39}{x}$$

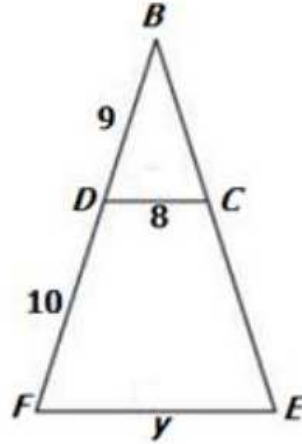
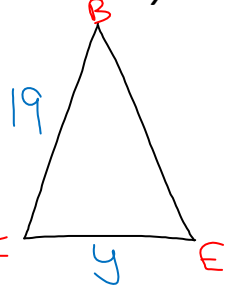
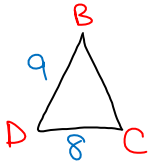
$$3x = 2 \times 39$$

$$3x = 78$$

$$x = 26$$

CODE YELLOW

What is the value of y ?



$$\frac{9}{19} \neq \frac{8}{y}$$

$$9y = 8 \cdot 19$$

$$9y = 152$$

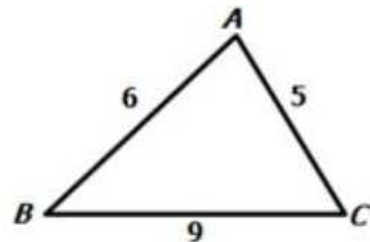
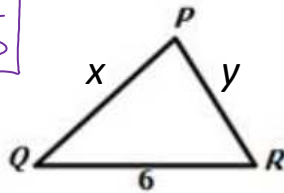
$$\frac{9y}{9} = \frac{152}{9}$$

$$y = 16.\bar{9}$$

CODE GREEN

What is the scale factor if $\Delta PQR \sim \Delta ABC$?

$$\frac{PQR}{ABC} \quad \frac{QR}{BC} = \frac{6}{9} = \frac{2}{3}$$



Find the value of x and y .

$$\frac{2}{3} \times \frac{x}{6}$$

$$3x = 2 \cdot 6$$

$$3x = 12$$

$$x = 4$$

$$\frac{2}{3} \times \frac{y}{5}$$

$$3y = 2 \cdot 5$$

$$3y = 10$$

$$y = 3.\bar{3}$$

CODE YELLOW

There are three ways to prove that triangles are SIMILAR

- Side-Side-Side Similarity (SSS~)
 - All three pairs of sides are proportional (have the same scale factor)
- Angle-Angle Similarity (AA~)
 - Two angles in each triangle are congruent
- Side-Angle-Side Similarity (SAS~)
 - Two pairs of adjacent sides are proportional and the angles between them are congruent

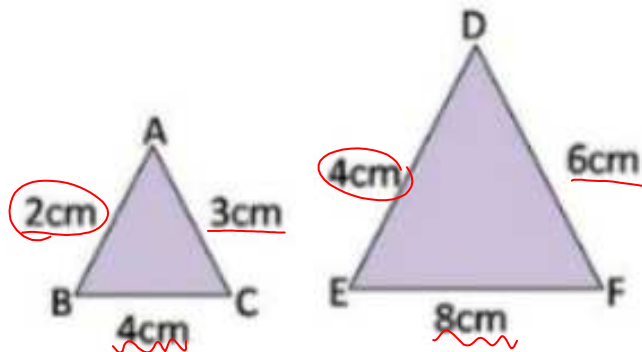
CODE YELLOW

Three Ways to Prove Triangles are Similar

1. Side – Side – Side Similarity (SSS~)

All three pairs of sides are proportional (have the same

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



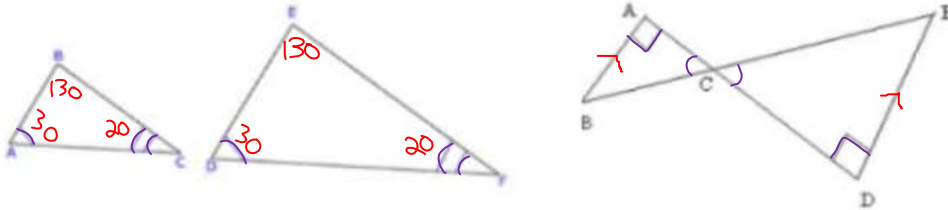
CODE YELLOW

Three Ways to Prove Triangles are Similar

2. Angle – Angle Similarity (AA~)

Two angles in each triangle are congruent.

180
30+20



**If two angles are the same, what do we know about the third angle?*

CODE YELLOW

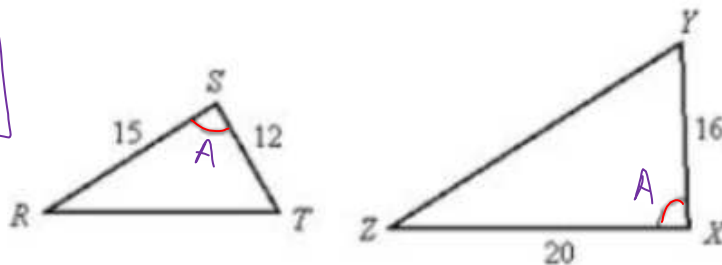
Three Ways to Prove Triangles are Similar

3. Side – Angle – Side Similarity (SAS~)

Two pairs of adjacent sides are proportional and the angles between them are congruent

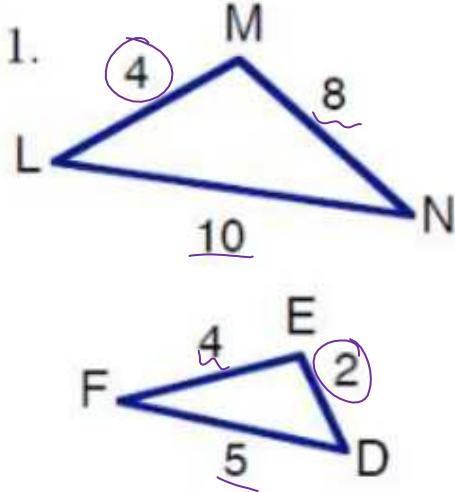
$$\frac{12}{16} = \frac{3}{4}$$

$$\frac{15}{20} = \frac{3}{4}$$



CODE YELLOW

Are the triangles similar?



$$\frac{4}{2} = \frac{2}{1}$$

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

$$\frac{10}{5} = \frac{2}{1}$$

YES

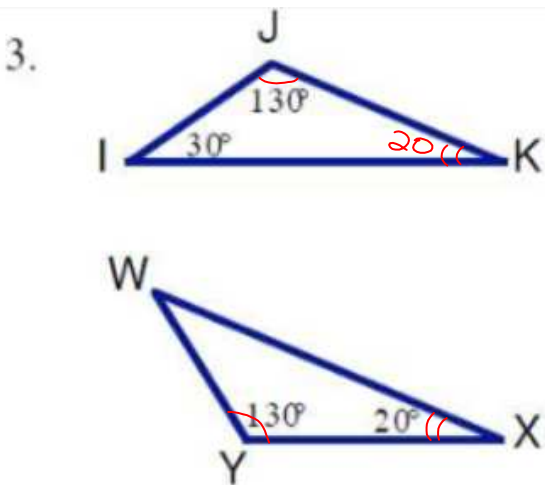
by

SSS~

$\triangle LMN \sim \triangle FED$

CODE YELLOW

Are the triangles similar?



Yes

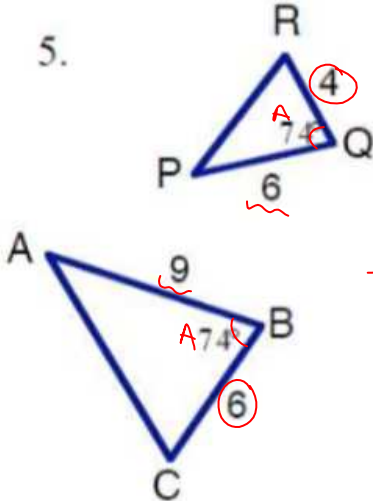
by

AA~

$\triangle IJK \sim \triangle WYX$

CODE YELLOW

Are the triangles similar?



$$\frac{4}{6} = \frac{2}{3}$$
$$\frac{6}{9} = \frac{2}{3}$$

Yes
by
SAS

$$\triangle PQR \sim \triangle ABC$$

CODE GREEN

KAHOOT!!

<https://create.kahoot.it/details/similar-triangles/c625796e-e167-4086-a1f0-4b4445cb169e>