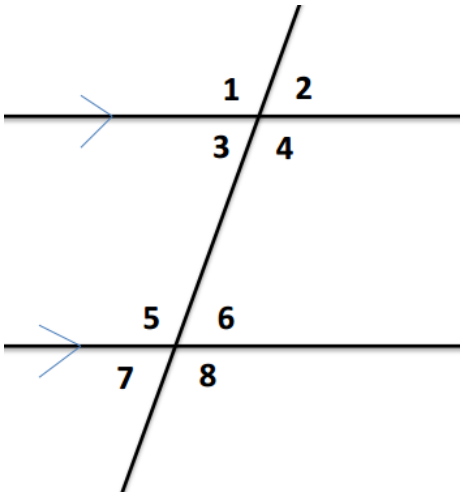
CODE RED – DO NOW

Complete Problems #1-3 **G.2a**

1. Circle the angle relationship between ∠3 and ∠6?

   a) **Alternate Exterior** b) **Same side interior**

   c) **Alternate Interior** d) **Corresponding**



2. If m∠5 = 128^o, what is m∠3?

3. If m∠7 = $12x - 8^o$ and m∠2 = $4x + 16^o$, what is the value of x?

RATIOS, PROPORTIONS, AND SIMILAR TRIANGLES

SOL G.7 and G.14d

By the end of class today, I will be able to use proportions to find the scale factor between two similar triangles, by completing guided notes collaboratively as a class and then scoring at least 67% (2 out of 3 questions) on a class exit ticket.

Essential Questions: G.7
How do you use proportions to find side lengths in similar polygons?
How can you prove two triangles are similar?
How can you identify corresponding parts of similar triangles?
How are similar and congruent triangles similar? How are they different?

Today's Agenda

- ✓ DO NOW
- ✓ Turn in Homework
- ✓ Ratios and Proportions
- ✓ Intro to Similar Figures
- ✓ Finding Scale Factor
- ✓ Exit Ticket

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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"

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

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Ratios:

Girls to Boys $\frac{4}{9}$ 4 to 9 4:9

Proportions:

$\frac{\text{Girls}}{\text{Boys}}\ \frac{4}{9} = \frac{40}{90}\ \frac{\text{Girls}}{\text{Boys}}$

How to Cross-Multiply:

$\frac{\text{Girls}}{\text{Boys}}\ \frac{4}{9} \times \frac{36}{x}$

$4x = 36 \times 9$

$\frac{4x}{4} = \frac{324}{4}$

$x = 81$

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Solve for x.

1) $\frac{14}{42} = \frac{x}{12}$

$42x = 14 \times 12$

$\frac{42x}{42} = \frac{168}{42}$

$x = 4$

2) $\frac{36}{x+5} = \frac{9}{4}$

$9(x+5) = 36 \times 4$

$9x + 45 = 144$

$-45 \quad -45$

$\frac{9x}{9} = \frac{99}{9}$

$x = 11$

3) $\frac{8}{6} = \frac{4x}{2x+4}$

$8(2x+4) = 6 \times 4x$

$16x + 32 = 24x$

$-16x \quad -16x$

$\frac{32}{8} = \frac{8x}{8}$

$4 = x$

CODE GREEN

Solve for x.

4) $\frac{10}{4} = \frac{x}{14}$

$4x = 10 \times 14$
$4x = 140$
$x = 35$

5) $\frac{2}{10} = \frac{9}{x+5}$

$2(x+5) = 9 \times 10$
$2x + 10 = 90$
$-10 \quad -10$
$\frac{2x = 80}{2 \quad 2}$
$x = 40$

6) $\frac{6}{x} = \frac{4}{x-6}$

$6x - 36 = 4x$
$-6x \quad -6x$
$\frac{-36 = -2x}{-2 \quad -2}$
$18 = x$

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Similar Figures:

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

△1 is similar to △2(△1 ~ △2). △1 is not similar to △3(△1 ≠ △3).

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

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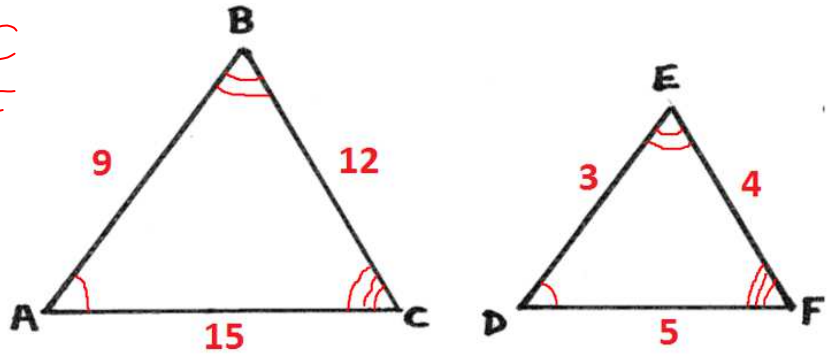
BAC
EDF



Similarity Statement

$\triangle BAC \sim \triangle EDF$

Corresponding angles are congruent

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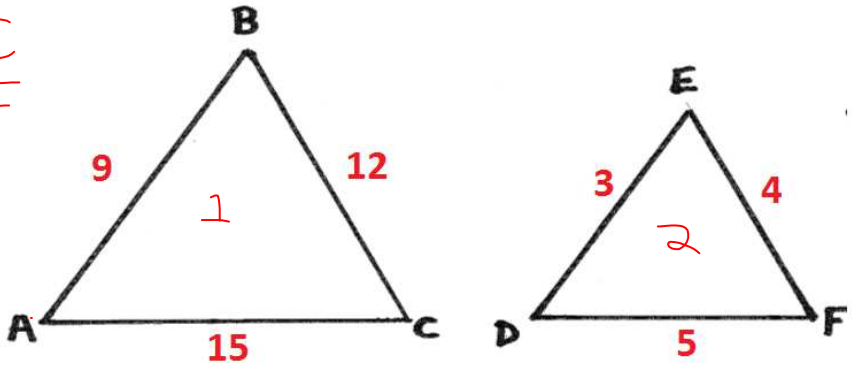
BAC
EDF



Scale factor
3/1 3:1
3 to 1

Ratios:

$\frac{AB}{DE} = \frac{9}{3}\left[\frac{3}{1}\right]$ $\frac{BC}{EF} = \frac{12}{4}\left[\frac{3}{1}\right]$ $\frac{AC}{DF} = \frac{15}{5}\left[\frac{3}{1}\right]$

Corresponding Sides are proportional

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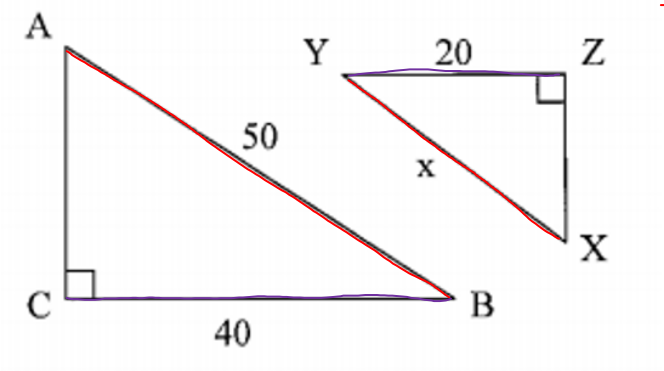
Find the scale factor and the value of *x*.

$\Delta ABC \sim \Delta XYZ$

ABC
XYZ



$\frac{AB}{XY} = \frac{50}{x}$ $\frac{CB}{ZY} = \frac{40}{20}$

$\frac{50}{x} \times \frac{40}{20}$

$40x = 50 \times 20$

$\frac{40x}{40} = \frac{1000}{40}$

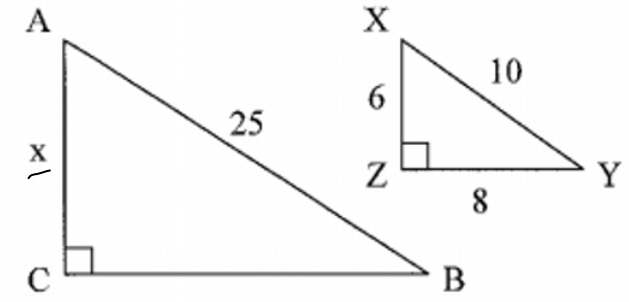
$x = 25$

CODE YELLOW

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

$\Delta ABC \sim \Delta XYZ$

ABC
XYZ



$\frac{AB}{XY} = \frac{25}{10}$ $\frac{AC}{XZ} = \frac{x}{6}$

$\frac{25}{10} \times \frac{x}{6}$

$10x = 25 \times 6$

$\frac{10x}{10} = \frac{150}{10}$

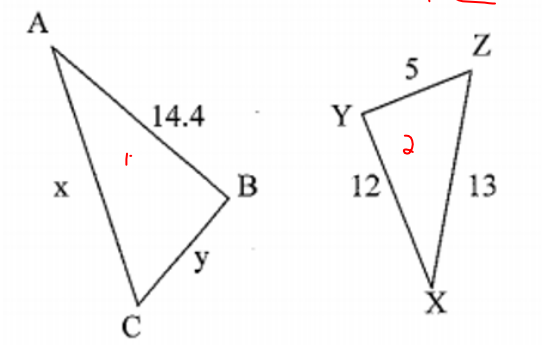
$x = 15$

CODE YELLOW

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

$\Delta ABC \sim \Delta XYZ$

$\frac{ABC}{XYZ}$



$\frac{AB}{XY} = \frac{14.4}{12}$ $\frac{AC}{XZ} = \frac{x}{13}$

$\frac{14.4}{12} = \frac{x}{13}$

$x = 15.6$

$\frac{BC}{YZ} = \frac{y}{5}$

$\frac{14.4}{12} = \frac{y}{5}$

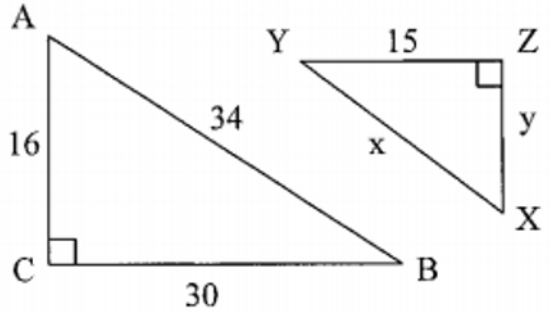
$y = 6$

CODE GREEN

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

$\Delta ABC \sim \Delta XYZ$

$\frac{ABC}{XYZ}$



$\frac{AB}{XY} = \frac{34}{x}$ $\frac{BC}{YZ} = \frac{30}{15}$ $\frac{AC}{XZ} = \frac{16}{y}$

$\frac{30}{15} = \frac{34}{x}$

$30x = 15 \times 34$

$\frac{30x}{30} = \frac{510}{30}$

$x = 17$

$\frac{30}{15} = \frac{16}{y}$

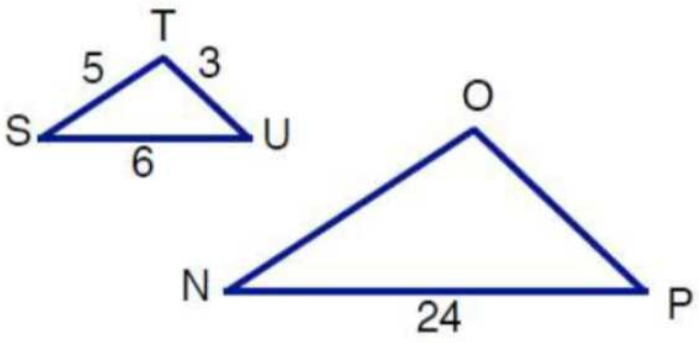
$30y = 16 \times 15$

$\frac{30y}{30} = \frac{240}{30}$

$y = 8$

CODE RED – EXIT TICKET

In problems 6-8 use the following picture and the given info: $\triangle STU \sim \triangle NOP$.



6. Find the scale factor.

7. Find the value of NO.

8. Find the value of OP.