

7.1 Proportions & Ratios

What is the ratio of boys to girls in this class?

$\frac{11}{10}$ 11:10

What is the ratio of girls to students in this class?

10:21 $\frac{10}{21}$

To solve a proportion, cross multiply

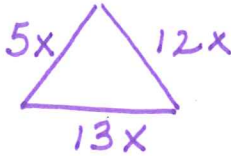
Ex1. Solve

$$\frac{4x-5}{3} = \frac{-26}{6}$$

$$\begin{aligned} 6(4x-5) &= 3(-26) \\ 24x-30 &= -78 \\ 24x &= -48 \\ \boxed{x} &= \boxed{-2} \end{aligned}$$

Ex2. In a triangle, the ratio of measures of 3 sides is 5:12:13 and the perimeter is 90 in. Find the measure of the shortest side.

Short
 $\frac{5(x)}{5(3)}$
 $= 15$



$$\begin{aligned} 5x + 12x + 13x &= 90 \\ \boxed{x} &= \boxed{3} \end{aligned}$$

7.2 Similar Figures

Similar Figures have same Shape, but may be different Size.

Similar figures must have: 1) ≅ corresponding angles AND

2) sides that are proportional (same SLR).

The ratio of sides is called the Scale Factor.

Are congruent figures also similar? Yes SLR = 1:1

Side length ratio

Ex 2: Determine if the triangles are similar.

Are corresponding angles equal? Yes.

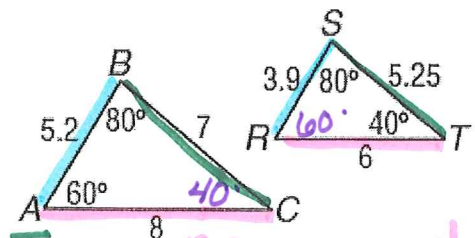
Are corresponding sides proportional?

$$\frac{AB}{RS} = \frac{5.2}{3.9} = 1.\bar{3}$$

Yes

$$\frac{BC}{ST} = \frac{7}{5.25} = 1.\bar{3}$$

$$\frac{AC}{RT} = \frac{8}{6} = \frac{4}{3} = 1.\bar{3}$$

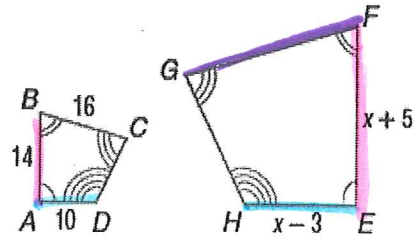


Similarity statement:

$\triangle ABC \sim \triangle RST$ because corr \angle s are \cong and SLR are =.

Ex3

Quad ABCD ~ Quad EFGH



a). Find x.

$$\frac{HE}{DA} = \frac{FE}{BA} \quad \frac{x-3}{10} = \frac{x+5}{14} \quad 14(x-3) = 10(x+5) \quad \leftarrow \text{show}$$

$$14x - 42 = 10x + 50$$

$$4x = 92$$

$$x = 23$$

b). Find the scale factor.

$$\frac{HE}{DA} = \frac{23-3}{10} = \frac{20}{10} = 2 \quad \text{aka SLR}$$

c). Find GF.

$$\frac{GF}{BC} = \frac{2}{1} \quad 16 \cdot \frac{GF}{16} = \frac{2}{1} \cdot 16$$

$$GF = 32$$

Ex4 Rectangle QRST is similar to rectangle JKLM with a scale factor of 1.5. If the length and width of rectangle QRST are 10 cm and 4cm, what are the length and width of rectangle JKLM?

$$L = 10 \text{ (SLR)} = 10(1.5) \Rightarrow L = 15 \text{ cm}$$

$$W = 4 \text{ (SLR)} = 4(1.5) \Rightarrow W = 6 \text{ cm}$$