Curriculum Outcomes:

(SS3) Demonstrate an understanding of similarity of polygons.

(SS4) Draw and interpret scale diagrams of 2-D shapes.

(SS5) Demonstrate an understanding of line and rotation symmetry.

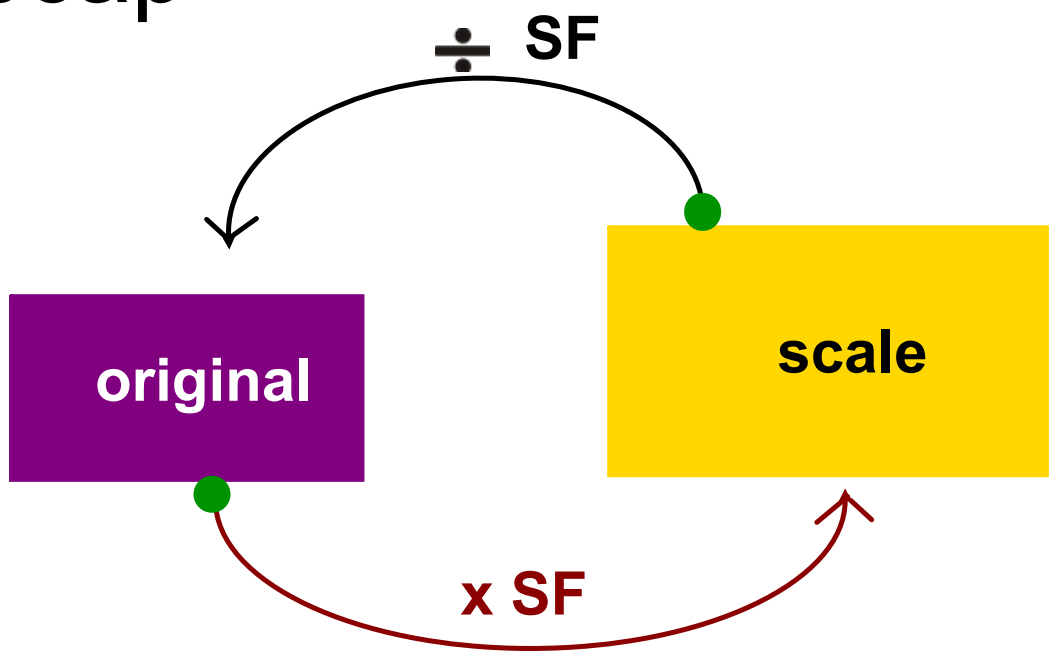
Student Friendly:

Proving triangles are similar and calculating unknown lengths based on similarities.

Scale Factor = $\frac{\textit{Length of Scale Diagram}}{\textit{Length of Original Diagram}}$

$$SF = \frac{\text{scale}}{\text{original}}$$

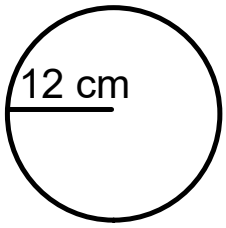
Recap



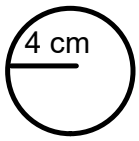
Warm Up

1) Determine the scale factor of the following:

Original



Scale



2) Determine the unknown lengths for the following, if the scale factor is 1/5

y

75 cm

9 cm

x

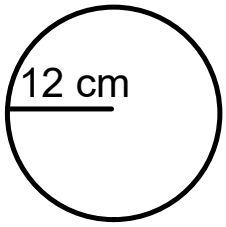
3) Determine the unknown lengths for the following

Diameter of original	Diameter of Scale	Scale Factor
23 cm		1/4
18 cm	14 cm	
	3.2 cm	5/2

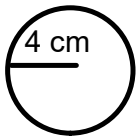
Warm Up

1) Determine the scale factor of the following:

Original

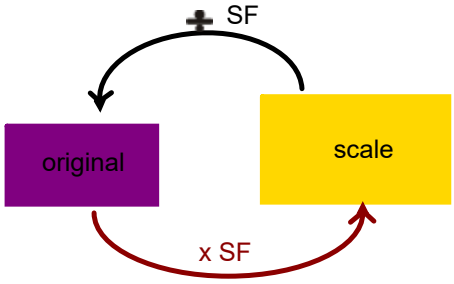


Scale

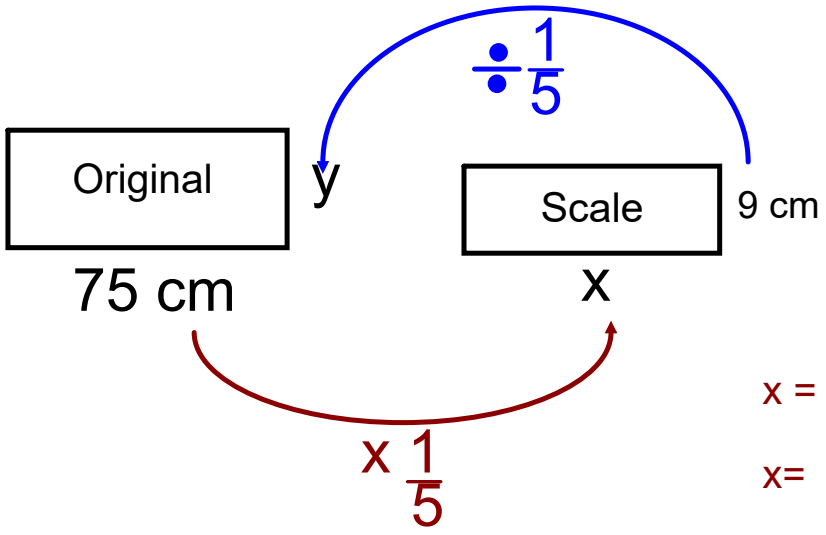


Scale factor = $\frac{\text{scale}}{\text{original}} = \frac{4}{12}$

$= 0.\overline{3}$



2) Determine the unknown lengths for the following , if the scale factor is 1/5



$y = 9 \div \frac{1}{5}$

$y = 9 \times \frac{5}{1}$

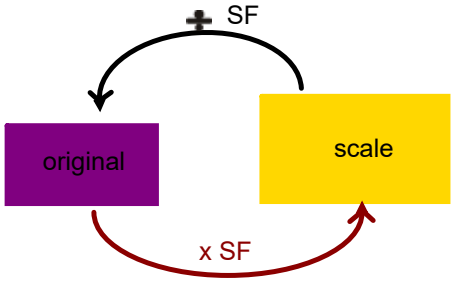
$y = 45$

$x = 75 \times \frac{1}{5}$

$x = \frac{75}{5}$

$x = 15$

Scale factor = $\frac{\text{scale}}{\text{original}}$



3) Determine the unknown lengths for the following

Diameter of original	Diameter of Scale	Scale Factor
23 cm	5.75	1/4
18 cm	14 cm	14/18 or 7/9
1.28	3.2 cm	5/2

a) Looking for scale

original × scale

23 x 1/4 = 5.75

b) Looking for scale factor

$SF = \frac{S}{O}$

$SF = \frac{14}{18}$

$SF = \frac{7}{9}$

c) Looking for original

Scale ÷ scale factor

3.2 ÷ 5/2

1.28

Quick Review from Chapter 6

Solve the following Ratios for the unknown variable:

$$\frac{4}{5} = \frac{x}{12.5}$$

$$\frac{4(12.5)}{5} = x$$

$$10 = x$$

$$\frac{3}{8} = \frac{15}{y}$$

$$3y = 15\,(8)$$

$$\frac{3y}{3} = \frac{15\,(8)}{3}$$

$$y = 40$$

You Try

$$\frac{x}{6.5} = \frac{8.5}{13}$$

$$x = \frac{(8.5)\,(6.5)}{13}$$

$$x = 4.25$$

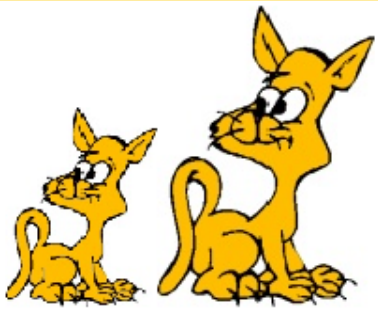
$$\frac{14}{y} = \frac{22}{5}$$

$$(14)\,(5) = (22)\,(y)$$

$$\frac{(14)\,(5)}{(22)} = (y)$$

$$3.18 = y$$


Section 7.4
Similar Triangles



The cat on the right is an enlargement of the cat on the left. They are exactly the same shape, but they are NOT the same size.

These cats are similar figures.

Objects, such as these two cats, that have the same shape, but do not have the same size, are said to be "similar".

The mathematical symbol used to denote similar is ~ .

Similar Symbol

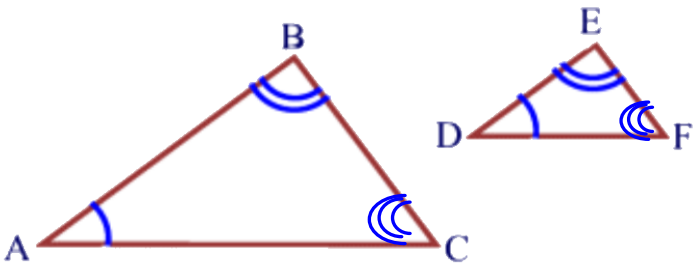
~

THERE ARE 3 WAYS TO PROVE TRIANGLES ARE SIMILAR:

1) **TRIANGLES ARE SIMILAR IF:**

AAA (ANGLE ANGLE ANGLE)

- **ALL THREE PAIRS OF CORRESPONDING ANGLES ARE THE SAME. …**



If

Original Scale

< A= < D

< B = <E

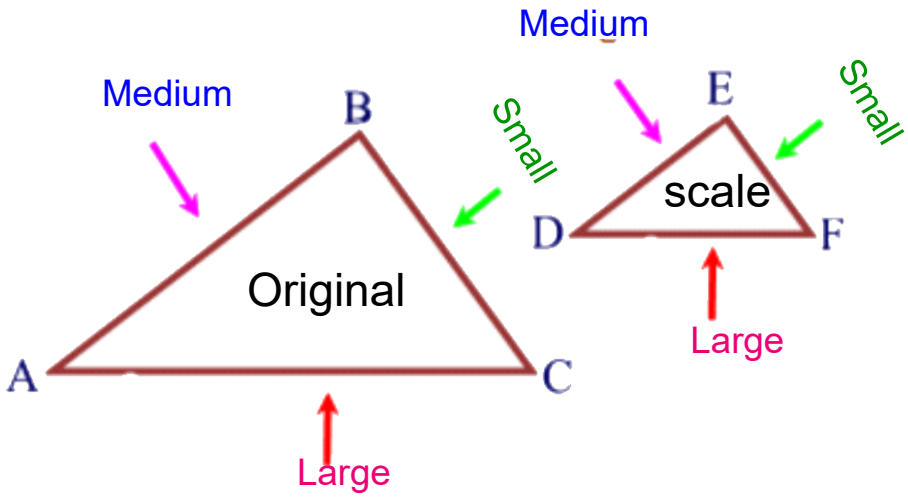
<C = <F

△ ABC ~ △ DEF (AAA)

2) TRIANGLES ARE SIMILAR IF:

SSS IN SAME PROPORTION (SIDE SIDE SIDE)

- ALL THREE PAIRS OF CORRESPONDING SIDES ARE IN THE SAME PROPORTION. ...



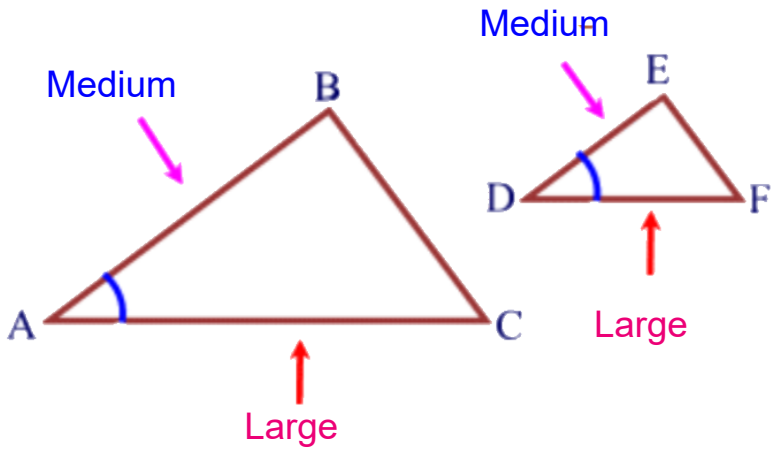
If the side ratios are the same

Small		Medium		Large
$\frac{EF}{BC}$	=	$\frac{DE}{AB}$	=	$\frac{DF}{AC}$

△ ABC ~ △ DEF (SSS)

3) TRIANGLES ARE SIMILAR IF:

- SAS (SIDE ANGLE SIDE)
- TWO PAIRS OF SIDES IN THE SAME PROPORTION AND THE INCLUDED ANGLE EQUAL.



If

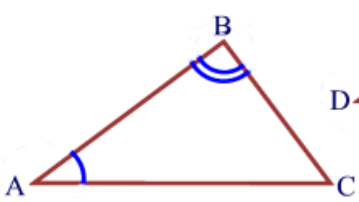
Side Med $\frac{DE}{AB}$ = Side Large $\frac{DF}{AC}$

Angle in between two sides $\angle A = \angle D$

$\triangle ABC \sim \triangle DEF$ (SAS)

Once the triangles are similar:

Theorem: The corresponding sides of similar triangles are in proportion.

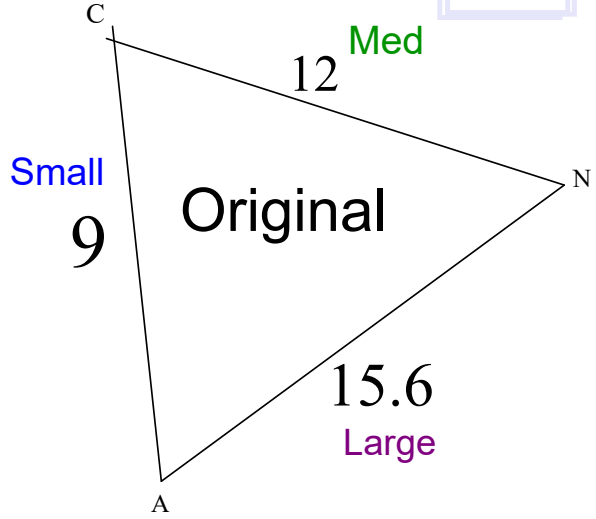


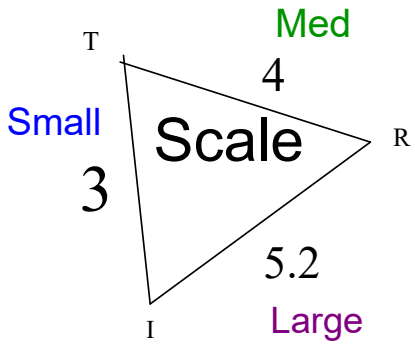
$If: \Delta ABC \sim \Delta DEF$

$Then: \frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

Are these triangles similar?

Triangles are just polygons





Prove similarity: (SSS)

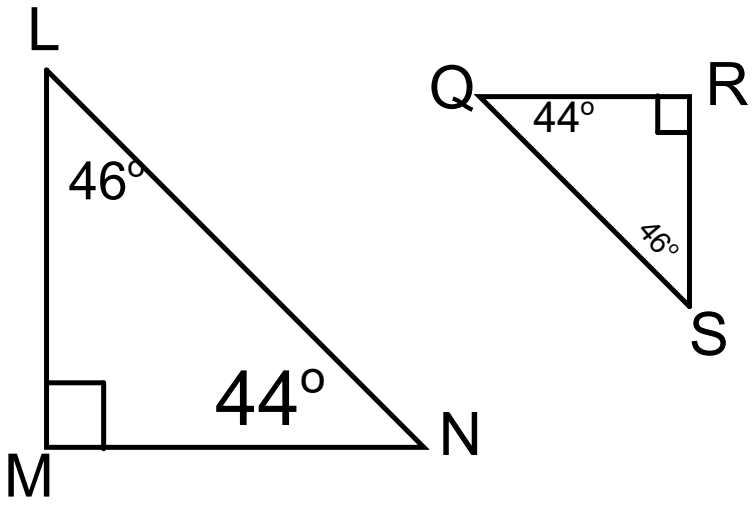
Small		Medium		Large
$\frac{IT}{AC}$	=	$\frac{TR}{CN}$	=	$\frac{IR}{AN}$
$\frac{3}{9}$	=	$\frac{4}{12}$	=	$\frac{5.2}{15.6}$
$0.\overline{3}$	=	$0.\overline{3}$	=	$0.\overline{3}$

$\triangle ITR \sim \triangle ACN$ (SSS)

Are these triangles similar?

Triangles are just polygons

Prove Similarity

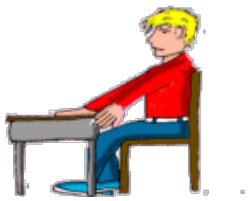


Prove similarity: (AAA)

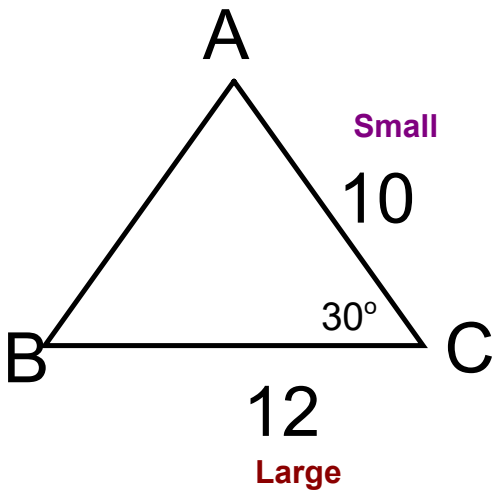
Original	Scale
< L	= <S
< M	= <R
< N	= < Q

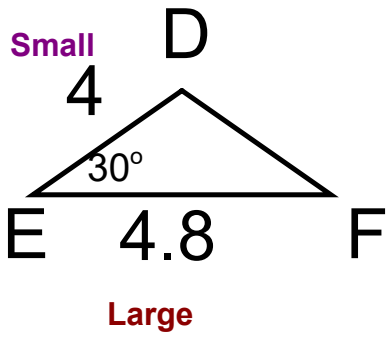
△ **LMN** ~ △ **SRQ** (AAA)

Are these triangles similar?



Prove Similarity





Prove similarity: (SAS)

Side Small Side Large

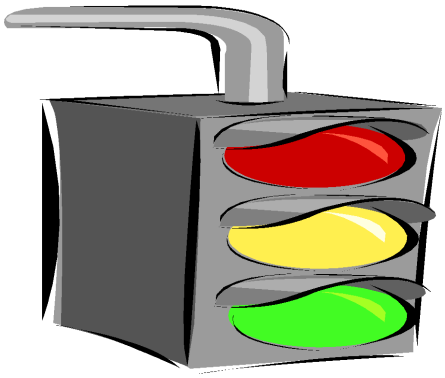
$$\frac{EF}{CB} = \frac{ED}{CA}$$

$$\frac{4.8}{12} = \frac{4}{10}$$

$$0.4 = 0.4$$

Angle in between two sides $\angle E = \angle C$

$\triangle EFD \sim \triangle CBA$ (SAS)



Must
Show
ALL
WORK

Class/Homework

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QUESTIONS

4) abc Show all work
5)abc Show all work