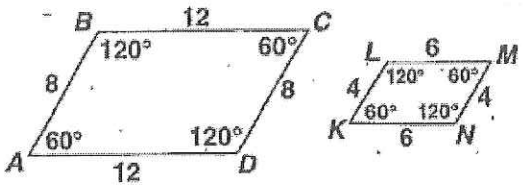
Are they Similar Figures?

NAME Key

Similar polygons have congruent corresponding angles and corresponding sides that are in proportion.
The symbol ~ means *is similar to*.



Example: Is parallelogram $ABCD \sim$ parallelogram $KLMN$?

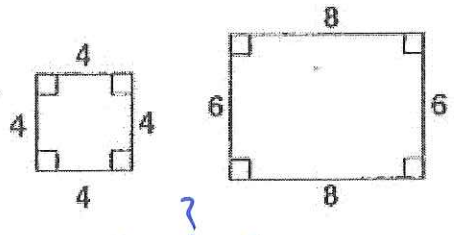
① Check corresponding angles. $\angle A \cong \angle K, \angle B \cong \angle L, \angle C \cong \angle M$, and $\angle D \cong \angle N$

② Compare corresponding sides. $\frac{AB}{KL} = \frac{8}{4} = \frac{2}{1}$ $\frac{BC}{LM} = \frac{12}{6} = \frac{2}{1}$

$\frac{CD}{MN} = \frac{8}{4} = \frac{2}{1}$ $\frac{DA}{NK} = \frac{12}{6} = \frac{2}{1}$

Tell whether each pair of polygons is similar. Explain why or why not.

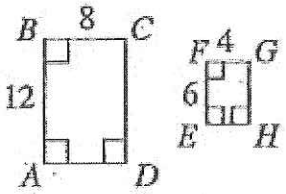
1.



No $\frac{8}{4} \stackrel{?}{=} \frac{6}{4}$

$32 \neq 24$

2.



S.F $= \frac{1}{2}$

Yes 1.) Corresponding $\angle$'s $\cong$

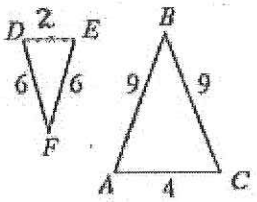
2.) Corresponding sides ~

$\frac{4}{8} = \frac{6}{12}$

$48 = 48$ ✓

3.) Similar shape but different size.

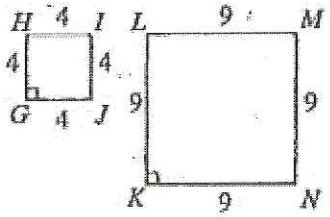
3.



No $\frac{4}{2} \stackrel{?}{=} \frac{9}{6}$

$24 \neq 18$

4.



Yes, 1.) Corresponding $\angle$'s $\cong$

2.) Corresponding sides ~

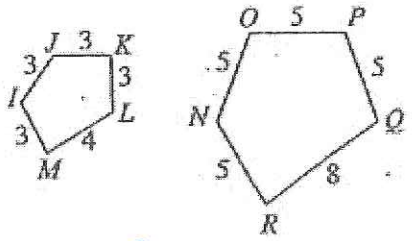
$\frac{9}{4} = \frac{9}{4}$

$36 = 36$ ✓

3.) Similar shape but different size

S.F. $= \frac{9}{4} = 2\frac{1}{4}$

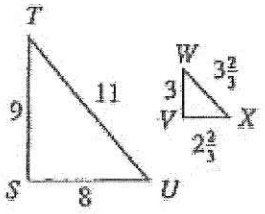
5.



No $\frac{8}{4} \stackrel{?}{=} \frac{5}{3}$

$24 \neq 20$

6.



S.F. $= \frac{1}{3}$

Yes 1.) Corresponding $\measuredangle$s $\cong$

2.) Corresponding sides $\sim$

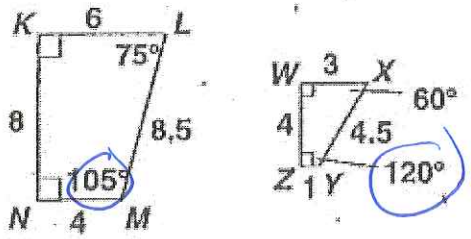
$\frac{3\frac{2}{3}}{11} = \frac{2\frac{2}{3}}{8}$ | $\frac{3}{9} = \frac{2\frac{2}{3}}{8}$

$11 \cdot \frac{8}{3} = 8 \cdot \frac{11}{3}$ | $24 = 9 \cdot \frac{8}{3}$

$\frac{88}{3} = \frac{88}{3}$ | $24 = 24$ ✓

3.) similar shape but different size.

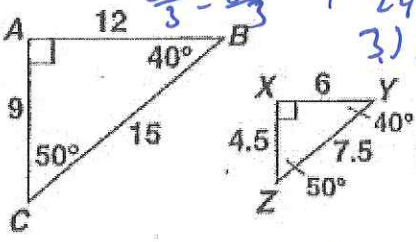
7.



No $\measuredangle 105° \neq \measuredangle 120°$

Corresponding $\measuredangle$s are NOT $\cong$

8.



Yes. 1.) Corresponding $\measuredangle$s $\cong$

2.) Corresponding sides $\sim$

$\frac{6}{12} = \frac{7.5}{15}$ | $\frac{6}{12} = \frac{4.5}{9}$

$90 = 90$ ✓ | $54 = 54$ ✓

3.) Similar shape but different size

S.F $= \frac{1}{2}$

Key

Find the Missing Side Length

You can use proportions to find unknown lengths in similar figures.

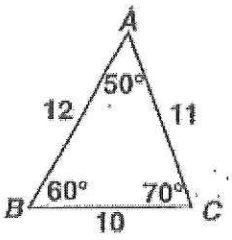
① To find EF, use a proportion. $\frac{AB}{DE} = \frac{BC}{EF}$ $\triangle ABC \sim \triangle DEF$

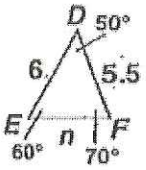
② Substitute. $\frac{12}{6} = \frac{10}{n}$

③ Use cross products. $12n = 60$

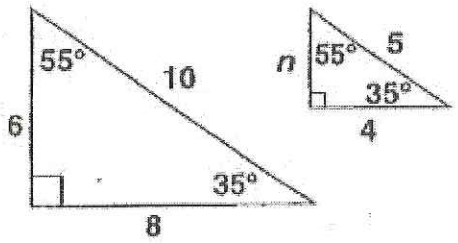
④ Solve. $n = 5$

$EF = 5$





9.



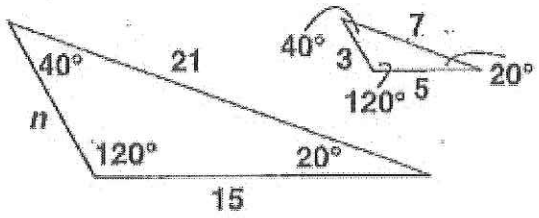
n = 3 units

Small $\frac{n}{6} = \frac{5}{10}$ Small
Big Big

$10n = 30$

$n = 3$ units

10.



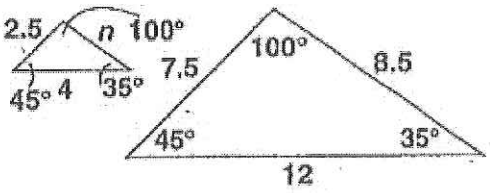
n = 9 units

Big $\frac{n}{3} = \frac{15}{5}$ Big
Small Small

$5n = 45$

$n = 9$ units

11.



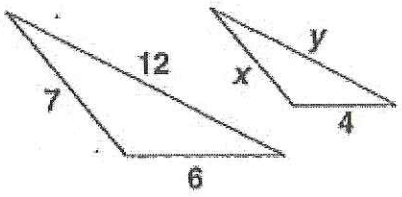
n = 2.8$\overline{3}$ units

Small $\frac{n}{8.5} = \frac{4}{12}$ Small
Big Big

$12n = 34$

$n = 2.8\overline{3}$ units

12.



x = 4.6$\overline{6}$ units y = 8 units

Small $\frac{x}{7} = \frac{4}{6}$ Small
Big Big

$6x = 28$

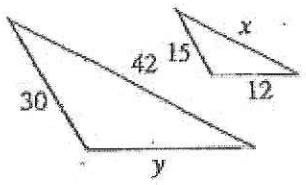
$x = 4.6\overline{6}$ units

small $\frac{y}{12} = \frac{4}{6}$ Small
Big Big

$6y = 48$

$y = 8$ units

13.



x = 21 units y = 24 units

Small/Big $\frac{x}{42} = \frac{15}{30}$ Small/Big

$30x = 630$

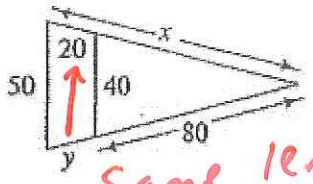
$x = 21$ units

Small/Big $\frac{12}{y} = \frac{15}{30}$ Small/Big

$15y = 360$

$y = 24$ units

14.



Same lengths

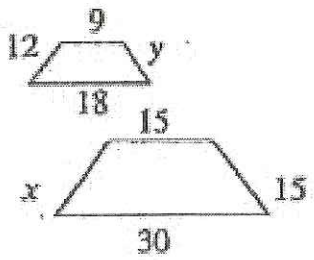
x = 100 units y = 20 units

Big/small $\frac{x}{80} = \frac{50}{40}$ Big/small

$40x = 4000$

$x = 100$ units

15.



x = 20 units y = 9 units

Big/small $\frac{x}{12} = \frac{15}{9}$ Big/small

$9x = 180$

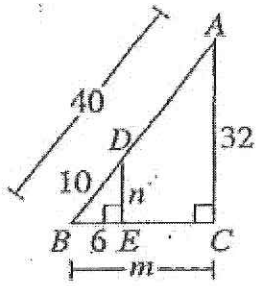
$x = 20$ units

Small/Big $\frac{y}{15} = \frac{9}{15}$ Small/Big

$15y = 135$

$y = 9$ units

16.



m = 24 units n = 8 units

Big/small $\frac{m}{6} = \frac{40}{10}$ Big/small

$10m = 240$

$m = 24$ units

Small/Big $\frac{n}{32} = \frac{10}{40}$ Small/Big

$40n = 320$

$n = 8$ units