Unit 7 Review   Period ___ Name __Key__

vertex→3x
base angles→ 1 x

Show work for each of the following.
1. Two supplementary angles are in the ratio   2. The vertex angle of an isosceles triangle is
    of 4:11. Find the measure of each angle.   three times as large as the base angles. Find
                                                        the measure of all three angles.

$4x + 11x = 180$ 4:11 $x + x + 3x = 180$ vertex: $3(36) =$ (108)
$15x = 180$ ↓   ↓ $5x = 180$ base angles
$x = 12$ ×12 ×12 $x = 36$ 36 each
                   ↓   ↓
                  (48 , 132)

Find the value of x.

3. $\dfrac{3}{5} \diagdown \dfrac{x}{4}$ 4. $\dfrac{x+5}{4} \diagdown \dfrac{2}{3}$ 5. $\dfrac{9}{4x+6} \diagdown \dfrac{7}{6x-4}$

   $5x = 12$ $3x + 15 = 8$ $54x - 36 = 28x + 42$
   (x = $\dfrac{12}{5}$) $3x = -7$ $26x = 78$
                                            (x = -7/3)   (x = 3)

6.   Which proportions are equivalent to $\dfrac{x}{12} = \dfrac{3}{4}$?

(A) $\dfrac{x}{3} = \dfrac{12}{4}$ [B] $\dfrac{x}{4} = \dfrac{12}{3.}$ (C) $\dfrac{12}{x} = \dfrac{4}{3}$ [D] $\dfrac{x+12}{12} = \dfrac{7}{4}$

[E] $\dfrac{x}{4} = \dfrac{3}{12}$ (F) $\dfrac{x+3}{16} = \dfrac{3}{4}$ (G) $\dfrac{3}{x} = \dfrac{4}{12}$ [H] $\dfrac{3}{12} = \dfrac{4}{x}$

In questions 7-11, ABCD ~ WXYZ.

7.   What is the scale factor of ABCD to WXYZ? $\dfrac{5}{15} = \dfrac{1}{3}$

$m\angle B + 180 + 70 = 360$
$m\angle B + 250 = 360$
$m\angle B = 110$
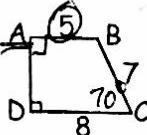
8. Find $m\angle A$ 9. Find $m\angle B$
        $90°$ $110°$

10. Find YZ   11. Find AD
   $\dfrac{1}{3} = \dfrac{8}{x}$ $\dfrac{1}{3} = \dfrac{x}{12}$
   $x = 24$ $3x = 12$
                          $x = 4$
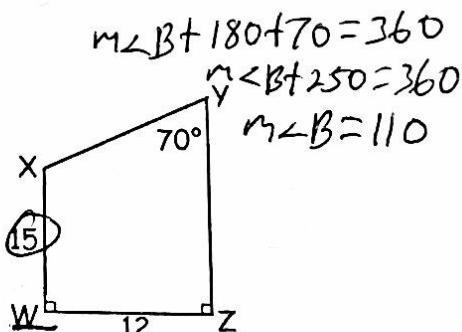
12.   Two similar polygons are shown.
      Find the value of each variable using proportions.

| Scale Factor 2:3	x	y	z
Proportion & Work	$\dfrac{2}{3} = \dfrac{x}{x+7}$ $3x = 2x + 14$	$\dfrac{2}{3} = \dfrac{8}{y}$ $2y = 24$	$\dfrac{2}{3} = \dfrac{10}{z+10}$ $30 = 2z + 20$
Value	$x = 14$	$y = 12$	$z = 5$
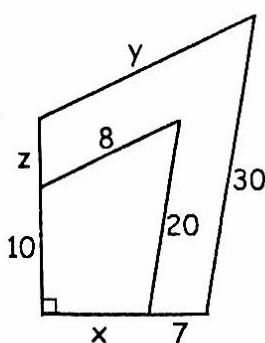
State each of the following. Draw and label a diagram to illustrate each.

13. Postulate for Similar Triangles

AA~
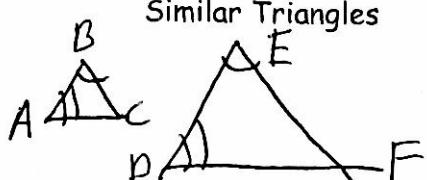
$\angle A \cong \angle D$, thus
$\angle B \cong \angle E$, $\triangle ABC \sim \triangle DEF$

14. Theorem #1 for Similar Triangles
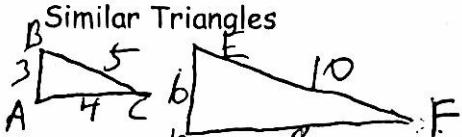
$\dfrac{AB}{DE} = \dfrac{BC}{EF} = \dfrac{FD}{CA}$, thus
$\triangle ABC \sim \triangle DEF$ by SSS~

15. Theorem #2 for Similar Triangles

$\angle ACB \cong \angle ECD$
$\dfrac{BC}{DC} = \dfrac{AC}{EC}$
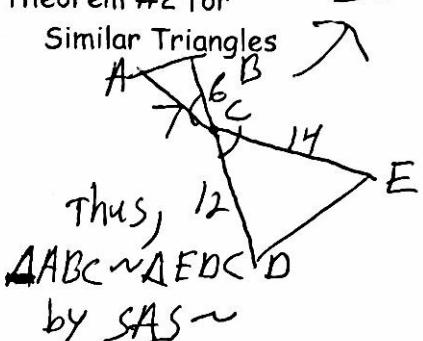

Thus, $\triangle ABC \sim \triangle EDC$ by SAS~

Can the two triangles shown be proved similar? If so, name the two triangles using a similarity statement and tell which similarity postulate or theorem you would use.

16.

$\dfrac{10}{16} = \dfrac{15}{24} = \dfrac{20}{32}$

$\dfrac{5}{8} = \dfrac{5}{8} = \dfrac{5}{8}$ ✓
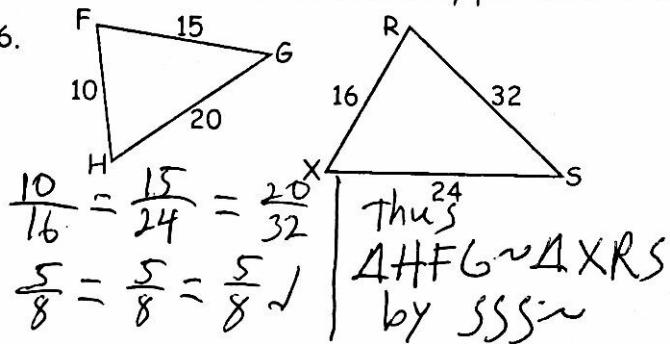
Thus $\triangle HFG \sim \triangle XRS$ by SSS~

17.
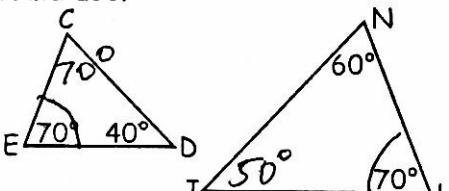
can't use AA~ (Not enough $\cong \angle$'s)
Thus, the triangles are not similar

Determine the scale factor and find the value of each variable using proportions.

18.
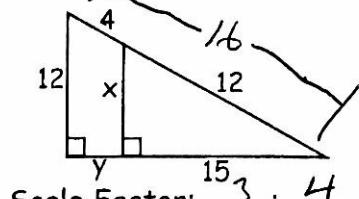
Scale Factor: __3__ : __4__

18.	Proportion & Work	Value
x	$\dfrac{3}{4} = \dfrac{x}{12}$) $4x = 36$	9
y	$\dfrac{3}{4} = \dfrac{15}{y+15}$) $60 = 3y+45$, $3y=15$	5

19.
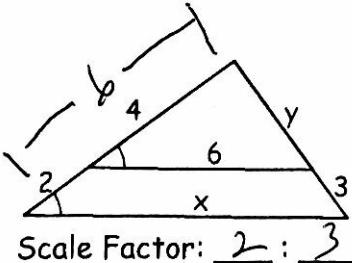
Scale Factor: __2__ : __3__

19.	Proportion & Work	Value
x	$\dfrac{2}{3} = \dfrac{6}{x}$) $2x = 18$	9
y	$\dfrac{2}{3} = \dfrac{y}{y+3}$) $3y = 2y+6$	6

Find the value of x using a proportion.

20.
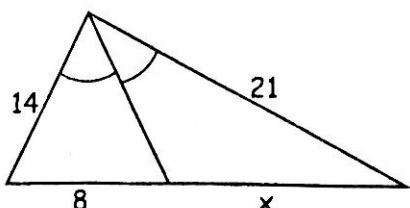
20.	Proportion & Work	Value
x	$\dfrac{8}{x} = \dfrac{14}{21}$) $\dfrac{8}{x} = \dfrac{2}{3}$) $2x = 24$	12

21.
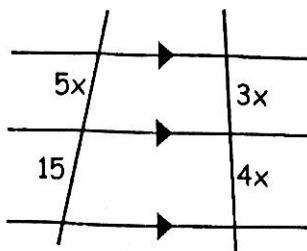
21.	Proportion & Work	Value
x	$\dfrac{5x}{15} = \dfrac{3x}{4x}$) $\dfrac{x}{3} = \dfrac{3}{4}$) $4x = 9$	9/4