# Unit 5 (Chapter 7) Test Review

Name **Master** *(handwritten)*

*Round all decimals to the nearest tenth.*

Date _____  Block _____

**OBJ: Be able to define the following geometry words.** *Write out each definition and give an example of each.*

1. What is a ratio? A comparison of 2 #s, written as $\frac{a}{b}$, $a:b$, or $a$ to $b$

2. What is a Proportion? An equation with 2 equal ratios (can be more than 2!).

3. What are Cross products? The product of the means = the product of the extremes $\frac{a}{b} = \frac{c}{d}$   $ad = bc$

4. What is the Scale factor? The reduced ratio of corresponding sides of similar polygons

5. What is the difference between Congruent Polygons and Similar Polygons?
$\cong$ polygons have $\cong$ corr $\angle$s AND $\cong$ corr sides; $\sim$ polygons have $\cong$ corr $\angle$s, but their sides are in proportion

**OBJ: Be able to solve a proportion.** *Find the value of x. SHOW ALL WORK.*

6. $\dfrac{x}{12} = \dfrac{3}{5}$

$5x = 3(12)$
$5x = 36$
$\boxed{x = 7.2}$

7. $\dfrac{4}{x} = \dfrac{6}{x+1}$

$4(x+1) = 6(x)$
$4x + 4 = 6x$
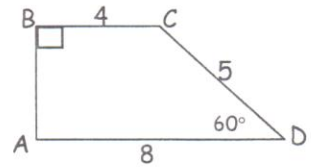$4 = 2x$
$\boxed{2 = x}$

8. $\dfrac{5x-3}{6} = \dfrac{x+5}{4}$

$4(5x-3) = 6(x+5)$
$20x - 12 = 6x + 30$
$14x - 12 = 30$
$14x = 42 \Rightarrow \boxed{x = 3}$

**OBJ: Be able to find all parts of similar polygons.**     *Given: ABCD ~ EFGH*
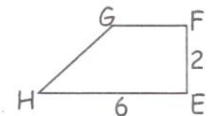
9. Write the proportionality statement using only letters.

$\dfrac{AB}{EF} = \dfrac{BC}{FG} = \dfrac{CD}{GH} = \dfrac{AD}{EH}$

10. Rewrite the proportionality statement by substituting in numbers from the figures.

$\dfrac{AB}{2} = \dfrac{4}{FG} = \dfrac{5}{GH} = \dfrac{8}{6} = \boxed{\dfrac{4}{3}} \downarrow$

11. The scale factor of ABCD to EFGH is __**4:3**__.  $\left(\dfrac{8}{6}\text{ reduced}\right)$

12. The ratio of the perimeter of EFGH to the perimeter of ABCD is __**3:4**__. ratio of Perimeters = ratio of corr. sides! ★ watch the order!

13. m∠F = __**90°**__ (= to m∠B)

14. m∠H = __**60°**__ (= to m∠D)

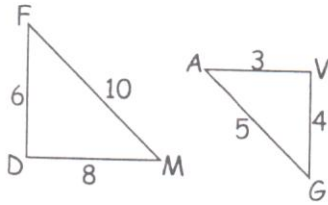15. FG = __**3**__     $\dfrac{4}{FG} = \dfrac{4}{3}$

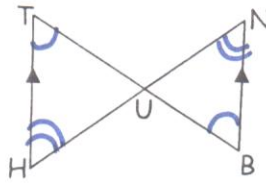16. AB ≈ __**2.7**__     $\dfrac{AB}{2} = \dfrac{4}{3}$   $3AB = 8$   $AB = \dfrac{8}{3}$

17. HG = __**3.75**__     $\dfrac{5}{GH} = \dfrac{4}{3}$   $4GH = 15$   $GH = \dfrac{15}{4}$ (GH & HG are the same!)
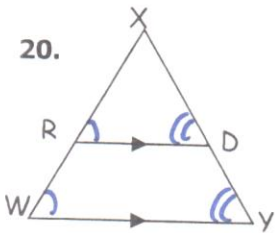
**OBJ:** Be able to identify similar triangles, state why they are similar, and write a similarity statement.
*Determine whether the 2 triangles shown are similar (Circle Yes or No).* SHOW WORK TO JUSTIFY YOUR ANSWER!
*If Yes, state why they are similar (AA~, SAS~, or SSS~) and write the triangle similarity statement.*
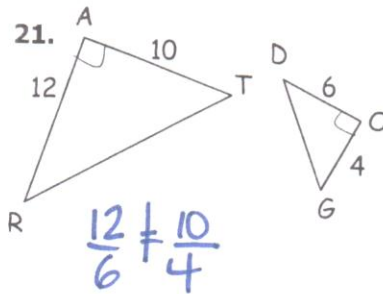
**18.**

F, 6, 10, D, 8, M, A, 3, V, 5, 4, G

$\frac{6}{3} = \frac{8}{4} = \frac{10}{5}$

$SF = 2:1$
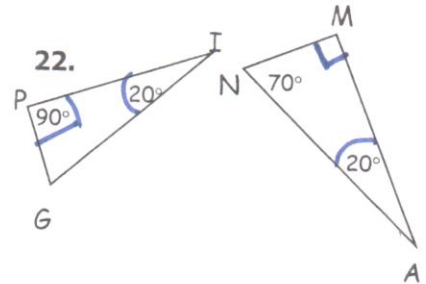
(Yes) No    Why: __SSS~__

$\triangle$__FDM__ ~ $\triangle$__AVG__

**19.**

T, N, U, H, B

(Yes) No   Why: __AA~__

$\triangle$__THU__ ~ $\triangle$__BNU__

**20.**

X, R, D, W, Y

(Yes) No   Why: __AA~__

$\triangle$__XRD__ ~ $\triangle$__XWY__

**21.**

A, 10, D, 12, T, 6, O, 4, R, G

$\frac{12}{6} \neq \frac{10}{4}$

Yes (No)   Why: __ratio of corr. sides $\neq$, so it's not SAS~__

$\triangle$_____ ~ $\triangle$_____

**22.**

M, I, P, 90°, 20°, N, 70°, G, 20°, A

(Yes) No   Why: __AA~__

$\triangle$__PIG__ ~ $\triangle$__MAN__

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**OBJ:** Be able to write a proportion when given a picture and solve for the variable.
*Find the value of x in each problem.* SHOW ALL WORK!

**23.** X=10

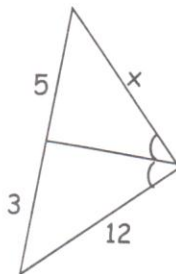18, 15, x - 4, x - 5
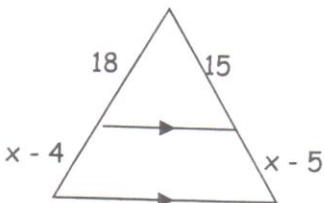
$\frac{18}{x-4} = \frac{15}{x-5}$

$18(x-5) = 15(x-4)$

$18x - 90 = 15x - 60$

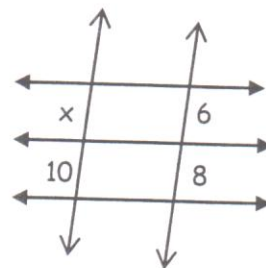$3x - 90 = -60$

$3x = 30 \Rightarrow$ __X=10__

**24.** X=20

5, x, 3, 12

$\frac{5}{3} = \frac{x}{12}$

$3x = 60$
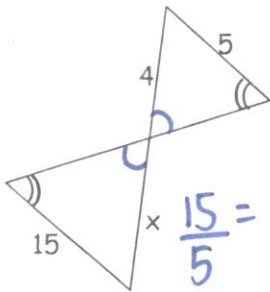
__X=20__

**25.** X=7.5

x, 6, 10, 8

$\frac{x}{10} = \frac{6}{8}$

$8x = 60$

__$x = \frac{60}{8} = 7.5$__

**26.** $x=12$

$\dfrac{15}{5}=\dfrac{x}{4}$
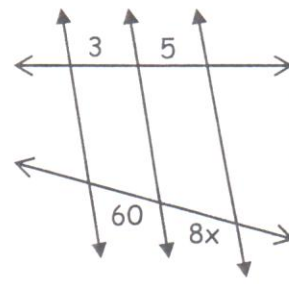
$5x=60$

$\boxed{x=12}$

**27.** $x=15$
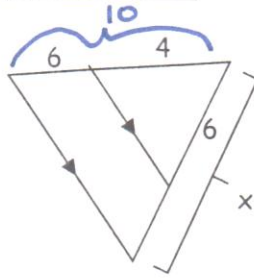
$\dfrac{6}{x}=\dfrac{4}{10} \Rightarrow 4x=60$

$\boxed{x=15}$

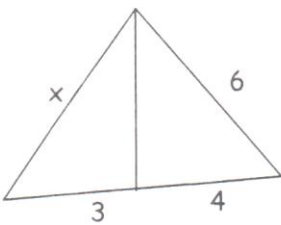*or $\dfrac{4}{6}=\dfrac{6}{x-6}$

**28.** $x=12.5$
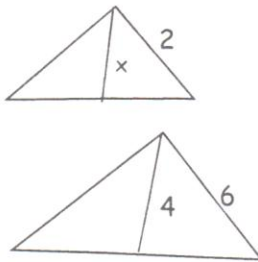
$\dfrac{3}{5}=\dfrac{60}{8x}$

$24x=300$

$\boxed{x=12.5}$

**29.** $x=4.5$
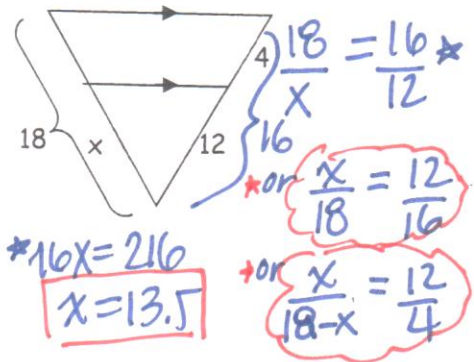
$\dfrac{x}{6}=\dfrac{3}{4} \Rightarrow 4x=18$

$x=4.5$

**30.** $x \approx 1.3$

$\dfrac{x}{4}=\dfrac{2}{6} \Rightarrow 6x=8$

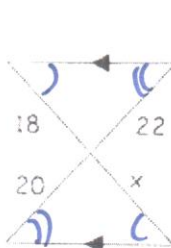$x=\dfrac{4}{3}$

**31.** $x=13.5$

$\dfrac{18}{x}=\dfrac{16}{12}$ ★

*or $\dfrac{x}{18}=\dfrac{12}{16}$

*$16x=216$

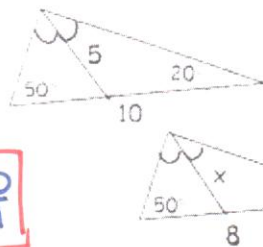$\boxed{x=13.5}$

+or $\dfrac{x}{18-x}=\dfrac{12}{4}$

**32.** $x \approx 16.4$

$\dfrac{18}{x}=\dfrac{22}{20}$

$22x=360$

$x=\dfrac{360}{22}=\dfrac{180}{11}$

**33.** $x=4$

$\dfrac{5}{x}=\dfrac{10}{8}$

$10x=40$

$\boxed{x=4}$

**34.** $x=12.75$
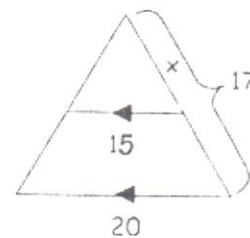
$\dfrac{15}{20}=\dfrac{x}{17}$

$20x=255$

$\boxed{x=12.75}$

**35.** $x=4.5$

$\dfrac{21}{9}=\dfrac{x+6}{x}$

$21x=9(x+6)$

$21x=9x+54$

$12x=54$

$\boxed{x=4.5}$
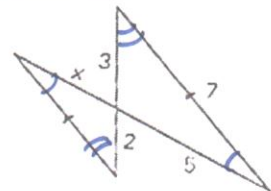
**36.** $x=11.2$
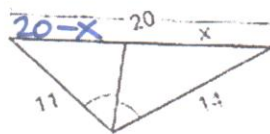
$\dfrac{20-x}{x}=\dfrac{11}{14}$

$11x=14(20-x)$

$11x=280-14x$

$25x=280$

$\boxed{x=11.2}$

**37.** $x \approx 3.3$

$\dfrac{x}{5}=\dfrac{2}{3}$

$3x=10$

$\boxed{x=\dfrac{10}{3}}$

**38.** $X=9.375$
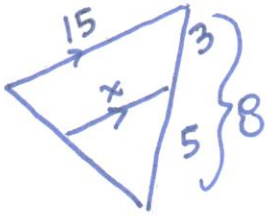
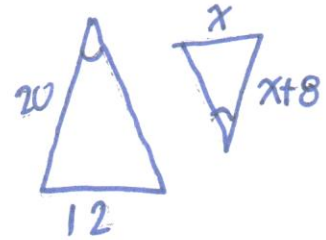$\frac{x}{15} = \frac{5}{8}$   $8x=75$

$\boxed{X=9.375}$

**39.** $X=2.25$
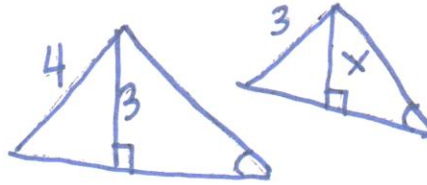
$\frac{4}{3} = \frac{3}{x}$   $4x=9$

$\boxed{X=\frac{9}{4}=2.25}$

**40.** $X=12$

$\frac{20}{x+8} = \frac{12}{x}$   $20x=12(x+8)$
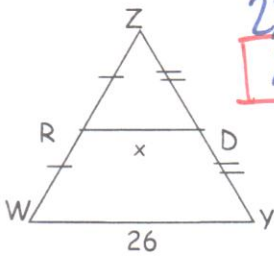$20x=12x+96$
$8x=96$

$\boxed{X=12}$

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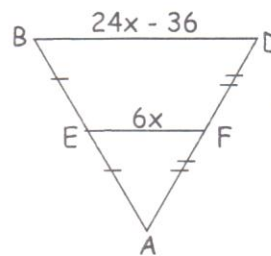**OBJ: Be able to find midsegments.** *Find the value of x in each problem.  SHOW ALL WORK!*

**41.** $X=13$

$2x=26$
$\boxed{X=13}$

**42.** $X=3$

$2(6x)=24x-36$
$12x=24x-36$
$-12x=-36$
$\boxed{X=3}$

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**OBJ: Be able to solve a word problem using proportions.** *Solve each word problem below.  First draw and label each picture with the information given.  Then write a proportion to find your variable.*

**43.** The ratio of one side of ΔMNO to the corresponding side of similar ΔPQR is 1 : 4. If the perimeter of ΔPQR is 100 inches, what is the **perimeter** of ΔMNO?
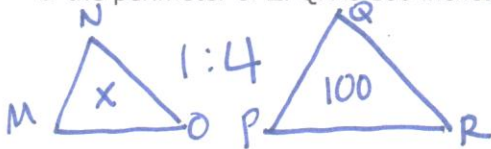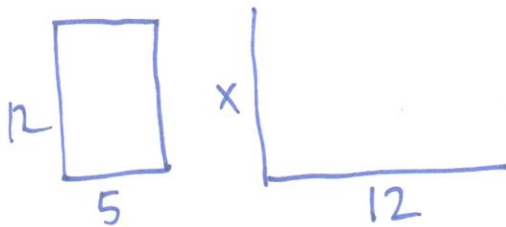
**43.** ___25 inches___

$\frac{x}{100} = \frac{1}{4}$
$4x=100$
$X=25$

**44.** A card that is 5 inches wide and 12 inches high was enlarged to be 12 inches wide.  How **high** is the enlargement?
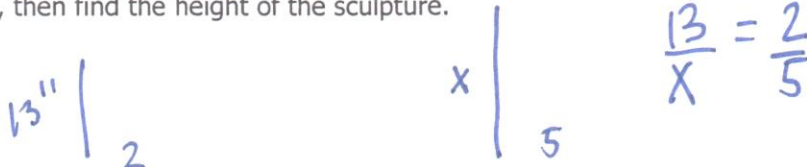
**44.** ___28.8 inches___

$\frac{12}{x} = \frac{5}{12}$
$5X=144$
$X=28.8$

**45.** Evan bought a 13 inch scale model of a sculpture in an art museum. If the ratio of the height of the scale model to the height of the sculpture is 2: 5, then find the height of the sculpture.

**45.** ___32.5 inches___
or 2.7 feet

$\frac{13}{x} = \frac{2}{5}$   $2X=65$
$X=32.5$