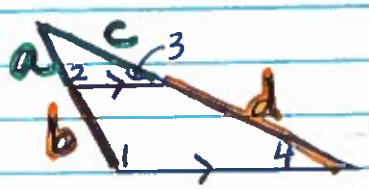
Day 51

7-5 Proportions in Triangles

Side-Splitter Thm

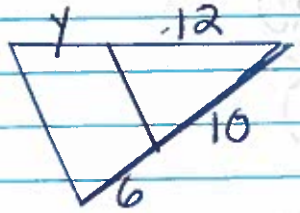
If a line is ∥ to one side of a △ and intersects the other 2 sides, then it ∥'s those sides proportionally.



$\frac{a}{b} = \frac{c}{d}$

$\angle 1 \cong \angle 2$
$\angle 3 \cong \angle 4$
corresponding ∠'s

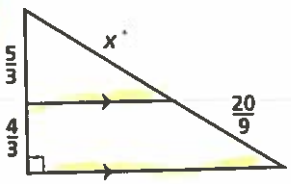
1.



$\frac{12}{y} = \frac{10}{6}$

$\frac{10y}{10} = \frac{72}{10}$ $\quad y = 7.2$

2.

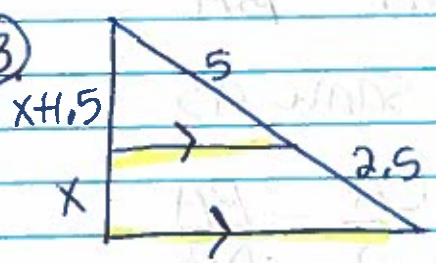


$\frac{x}{\frac{20}{9}} = \frac{\frac{5}{3}}{\frac{4}{3}}$

$\frac{3}{4} \cdot \frac{4}{3} x = \frac{100}{9} \cdot \frac{3}{4}$

$x = \frac{25}{9}$

3.

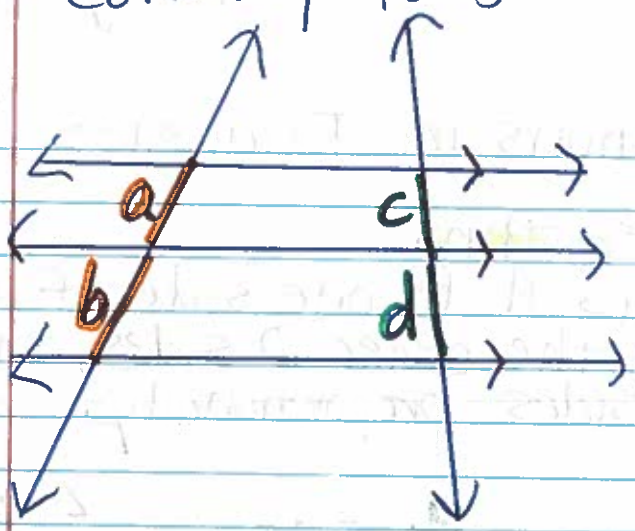


$\frac{x+1.5}{x} = \frac{5}{2.5}$

$5x = 2.5(x+1.5)$
$5x = 2.5x + 3.75$
$-2.5x \quad -2.5x$
$\frac{2.5x}{2.5} = \frac{3.75}{2.5}$

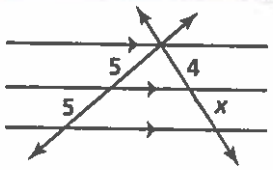
$x = 1.5$

Corollary to side-splitter thm.



$$\frac{a}{b} = \frac{c}{d}$$

(4)

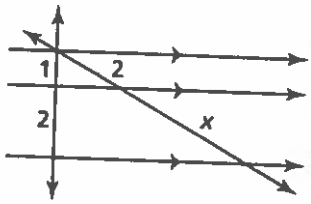


$$\frac{5}{5} = \frac{4}{x}$$

$$\frac{5x}{5} = \frac{20}{5}$$

$x = 4$

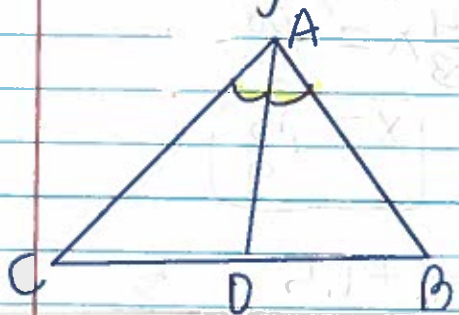
(5.)



$$\frac{1}{2} = \frac{2}{x}$$

$x = 4$

Triangle-Angle Bisector Thm

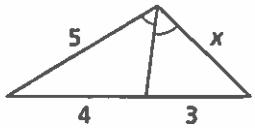


$$\frac{CD}{DB} = \frac{CA}{BA}$$

same as

$$\frac{CA}{CD} = \frac{BA}{DB}$$

(6.)

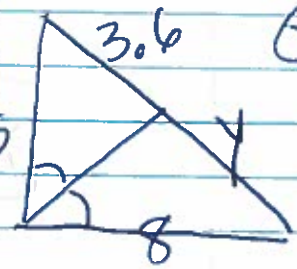


$$\frac{5}{x} = \frac{4}{3}$$

$$\frac{4x}{4} = \frac{15}{4}$$

$x = \frac{15}{4}$

(7)



$$\frac{3.6}{y} = \frac{5}{8}$$

$$\frac{5y}{5} = \frac{28.8}{5}$$

$y = 5.76$

Name _____ Class B1 Date 3/22/18

Reteaching 7-5 NOTES Day 51

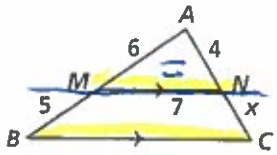
Proportions in Triangles

OBJECTIVE: Investigating proportional relationships in triangles

MATERIALS: Calculator

Example

Find the value of each variable.



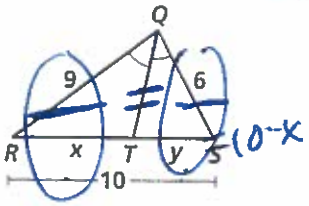
$\frac{6}{5} = \frac{4}{x}$

$\frac{AM}{MB} = \frac{AN}{NC}$ by the Side-Splitter Theorem

$\frac{6}{5} = \frac{4}{x}$ by substitution

$6x = 20$ by cross-multiplication

$x = \frac{10}{3}$



QT is the angle bisector

$\frac{9}{x} = \frac{6}{y}$

$\frac{QR}{QS} = \frac{RT}{ST}$ by the Triangle-Angle-Bisector Theorem

$\frac{9}{6} = \frac{x}{y}$ by substitution

$\frac{9}{6} = \frac{x}{10 - x}$ because $x + y = 10$

$\frac{9}{x} = \frac{6}{10-x}$

$9(10 - x) = 6x$ by cross-multiplication

$90 - 9x = 6x$

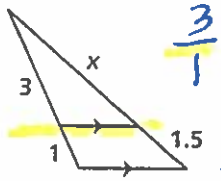
$90 = 15x$

$6 = x$

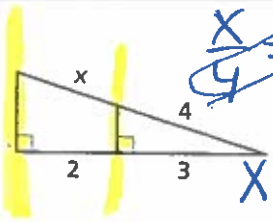
$4 = y$

Exercises

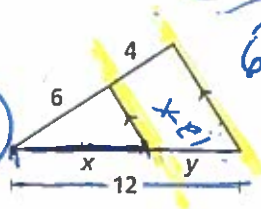
Find the value of each variable.

1. 

$\frac{3}{1} = \frac{x}{1.5}$ $x = 4.5$

2. 

$\frac{x}{4} = \frac{2}{3}$ $x = \frac{8}{3} = 2\frac{2}{3}$

3. 

$\frac{x}{12-x} = \frac{6}{4}$

$6(12-x) = x \cdot 4$

$72 - 6x = 4x$

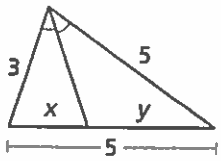
$+6x \quad +6x$

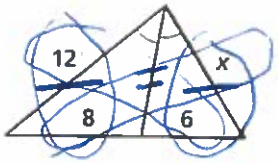
$\frac{72}{10} = \frac{10x}{10}$

$7.2 = x$

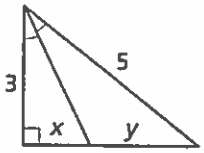
$y = 12 - 7.2$

$y = 4.8$

4. 

5. 

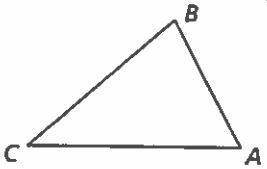
$\frac{8x}{8} = \frac{72}{8}$ $x = 9$

6. 

In $\triangle ABC$, $AB = 6$, $BC = 8$, and $AC = 9$.

7. The bisector of $\angle A$ meets $\overline{BC}$ at point N. Find BN and CN.

8. $\overline{XY} \parallel \overline{CA}$. Point X lies on $\overline{BC}$ such that $BX = 2$, and Y is on $\overline{BA}$. Find BY.

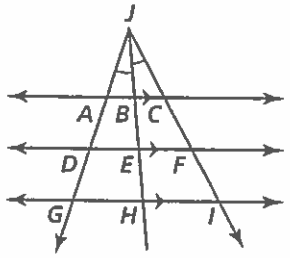


Name _____ Class _____ Date _____

Practice 7-5

Proportions in Triangles

Use the figure at the right to complete each proportion.



1. $\frac{AD}{DG} = \frac{?}{EH}$

2. $\frac{CF}{BE} = \frac{FI}{?}$

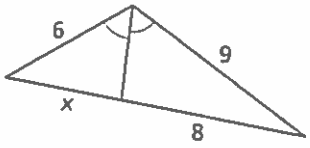
3. $\frac{JA}{JC} = \frac{AB}{?}$

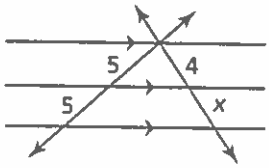
4. $\frac{JF}{FE} = \frac{?}{DE}$

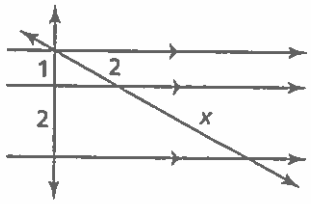
5. $\frac{GH}{HI} = \frac{?}{?}$

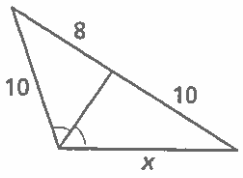
6. $\frac{AD}{AG} = \frac{?}{BH}$

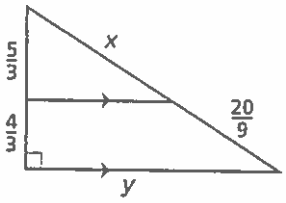
Algebra **Find the values of the variables.**

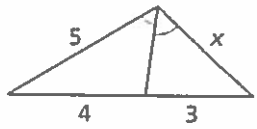
7. 

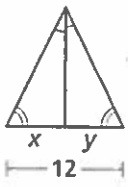
8. 

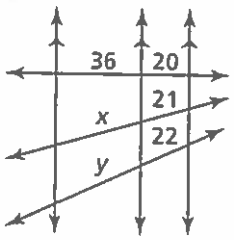
9. 

10. 

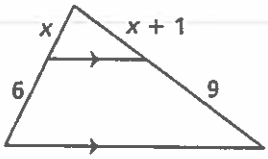
11. 

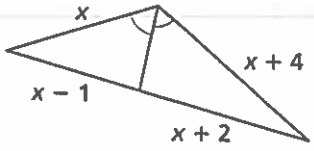
12. 

13. 

14. 

Algebra **Solve for x.**

15. 

16. 

17.