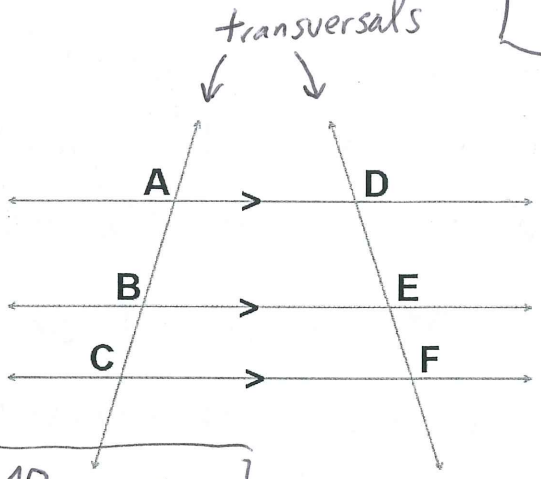
7-4b Parallel Lines and Proportional Parts

Key

Corollary: Proportional Parts of Parallel Lines

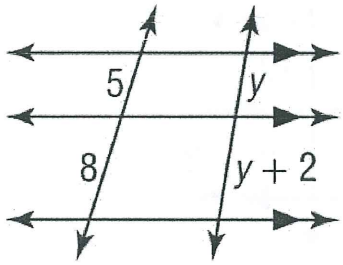
If 3 or more parallel lines intersect 2 transversals, then they cut off the transversals proportionally.



If $\overline{AE} \parallel \overline{BF} \parallel \overline{CG}$, then $\frac{AB}{BC} = \frac{EF}{FG}$

Ex) Solve for x or y.

1.



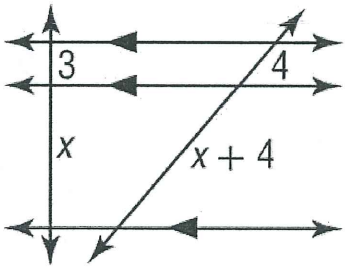
$\frac{5}{8} = \frac{y}{y+2}$

$5y + 10 = 8y$

$10 = 3y$

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

2.



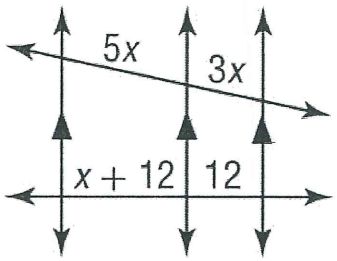
$\frac{3}{x} = \frac{4}{x+4}$

$3(x+4) = 4x$

$3x + 12 = 4x$

$12 = x$

3.



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

$3x(x+12) = 5x(12)$

$3x^2 + 36x = 60x$

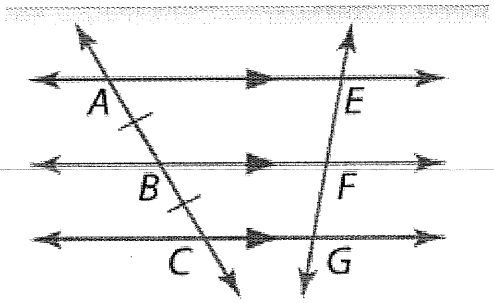
$3x^2 - 24x = 0$

$3x(x-8) = 0$

$x = 0, x = 8$

$x = 8$

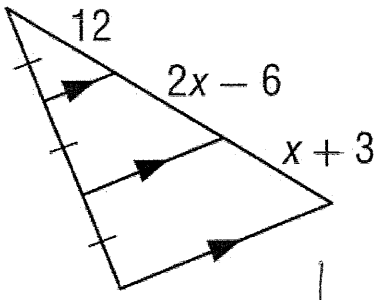
Corollary: Congruent Parts of Parallel Lines



If 3 or more parallel lines cut off congruent segments on one transversal, then they cut off congruent segments on every transversal.

Ex) Solve for x and y.

4.



$12 = 2x - 6$

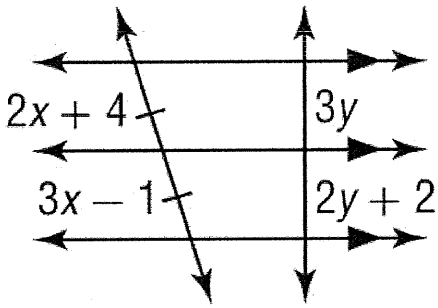
$18 = 2x$

$\boxed{9 = x}$

$12 = x + 3$

$\boxed{9 = x}$

5.



$2x + 4 = 3x - 1$

$\boxed{5 = x}$

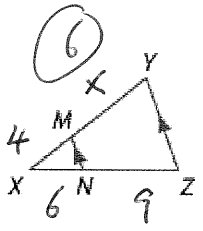
$3y = 2y + 2$

$\boxed{y = 2}$

Homework 7-4b Parallel Lines and Proportional Parts November 4 (Wed) Problems 1-27 odds

$XY = 4+6 = 10$

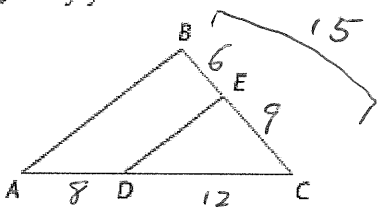
1. If $XM = 4$, $XN = 6$, and $NZ = 9$, find XY.
2. If $XN = 6$, $XM = 2$, and $XY = 10$, find NZ.



$\frac{x}{4} = \frac{9}{6}$

$6x = 36 \quad x = 6$

3. In $\triangle ABC$, $BC = 15$, $BE = 6$, $DC = 12$, and $AD = 8$. Determine whether $\overline{DE} \parallel \overline{AB}$. Justify your answer.

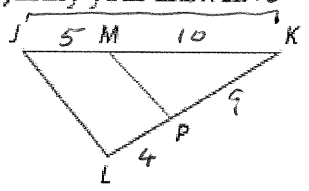


$\frac{6}{9} = \frac{8}{12}$

$\frac{2}{3} = \frac{2}{3}$ ✓

yes $DE \parallel AB$

4. In $\triangle JKL$, $JK = 15$, $JM = 5$, $LK = 13$, and $PK = 9$. Determine whether $\overline{JL} \parallel \overline{MP}$. Justify your answer.

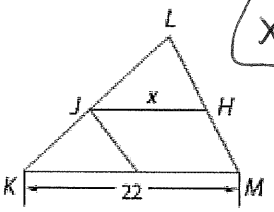


$\frac{5}{9} \neq \frac{4}{9}$

JL and MP are not parallel.

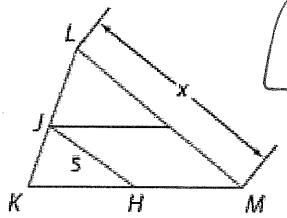
$\overline{JH}$ is a midsegment of $\triangle KLM$. Find the value of x.

5.



$x = 11$

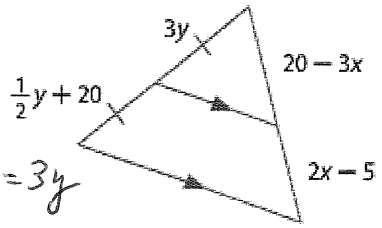
6.



$LM = 10$

ALGEBRA Find x and y.

8.



$\frac{1}{2}y + 20 = 3y$

$20 = 2.5y$

$8 = y$

$20 - 3x = 2x - 5$

$25 = 5x$

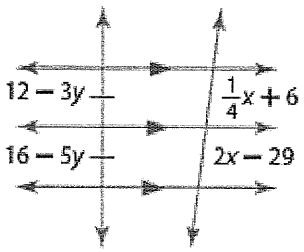
$5 = x$

$12 - 3y = 16 - 5y$

$2y = 4$

$y = 2$

9.



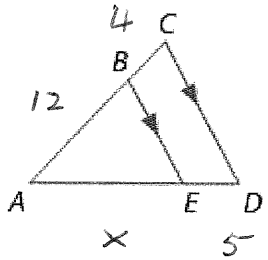
$\frac{1}{4}x + 6 = 2x - 29$

$35 = 1.75x$

$20 = x$

and Problem Solving

10. If $AB = 6$, $BC = 4$, and $AE = 9$, find ED.
11. If $AB = 12$, $AC = 16$, and $ED = 5$, find AE.
12. If $AC = 14$, $BC = 8$, and $AD = 21$, find ED.
13. If $AD = 27$, $AB = 8$, and $AE = 12$, find BC.



$\frac{x}{5} = \frac{12}{4}$

$4x = 60$

$x = 15$

13) $\frac{8}{x} = \frac{12}{15}$

$\frac{8}{x} = \frac{4}{5}$

$4x = 40$

$x = 10$

Determine whether $\overline{VY} \parallel \overline{ZW}$. Justify your answer.

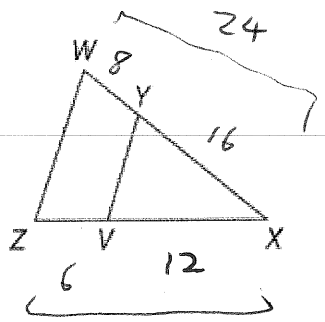
14. $ZX = 18$, $ZV = 6$, $WX = 24$, and $YX = 16$ yes

15. $VX = 7.5$, $ZX = 24$, $WY = 27.5$, and $WX = 40$

16. $ZV = 8$, $VX = 2$, and $YX = \frac{1}{2}WY$

17. $WX = 31$, $YX = 21$, and $ZX = 4ZV$

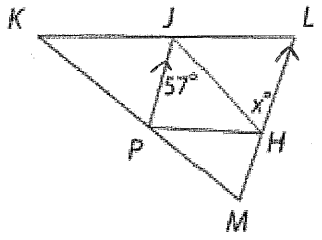
$\frac{10}{21} \neq \frac{x}{4x}$



$\frac{8}{16} = \frac{6}{12}$ ✓

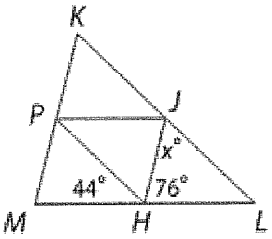
$\overline{JH}$, $\overline{JP}$, and $\overline{PH}$ are midsegments of $\triangle KLM$. Find the value of x.

18.

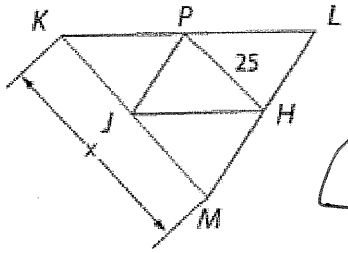


$x = 57°$

19

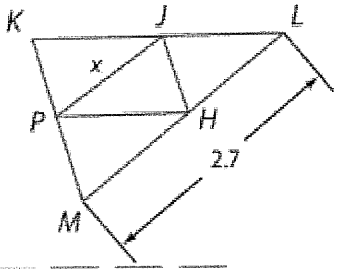


20.



$x = 50$

21.

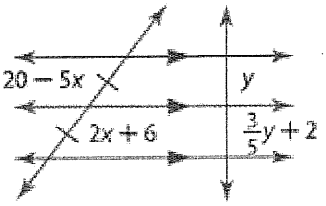


$x = \frac{2.7}{2}$

$x = 1.35$

ALGEBRA Find x and y.

24.



$20 - 5x = 2x + 6$

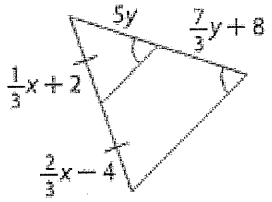
$14 = 7x$

$2 = x$

$y = \frac{3}{5}y + 2$

$0.4y = 2$

25.



$\frac{1}{3}x + 2 = \frac{2}{3}x - 4$

$6 = \frac{1}{3}x$

$18 = x$

$y = 5$

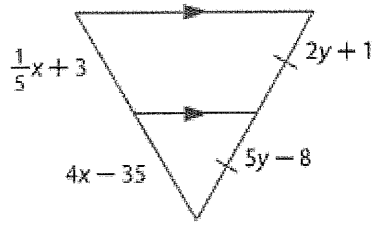
$5y = \frac{7}{3}y + 8$

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

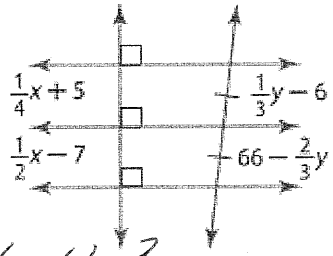
$y = 3$

ALGEBRA Find x and y.

26.



27.



$\frac{1}{4}x + 5 = \frac{1}{2}x - 7$

$12 = \frac{1}{2}x$

$24 = x$

$\frac{1}{3}y - 6 = 66 - \frac{2}{3}y$

$1y = 72$