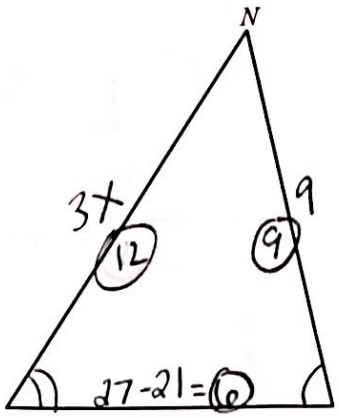
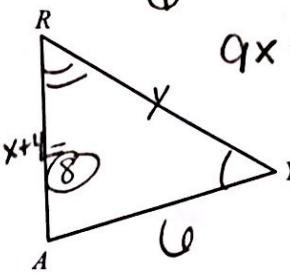
Honors Geometry
Chapter 7 Supplement

Name: Answer Key

1. Given: $\angle E \cong \angle Y$, $\angle W \cong \angle R$, $NW = 3x$, $AY = 6$, $AR = x + 4$, $NE = 9$, The perimeter of $\Delta NEW = 27$

Triangles are similar by AA~





$\frac{9}{6} = \frac{3x}{x+4}$

$9x + 36 = 18x$

$36 = 9x$

$4 = x$

Determine the following:

a) $YR = 4$

b) $NW = 12$

c) $AY = 6$

d) $WE = 6$

$\frac{6}{y} = \frac{3}{2}$

$12 = 3y$

$4 = y$

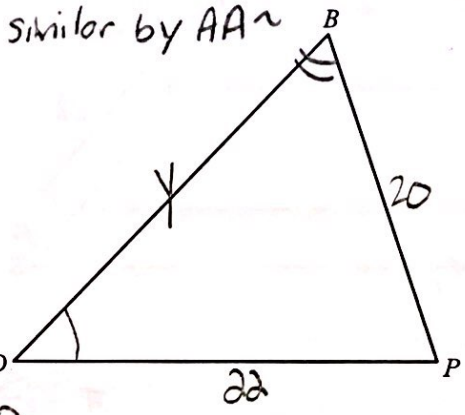
e) Determine the ratio of the perimeter of ΔNEW to the perimeter of ΔAYR.

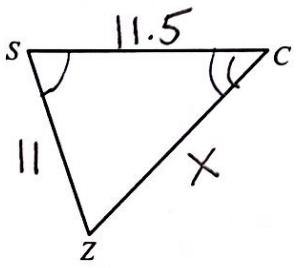
$\Delta NEW \sim \Delta AYR$

ratio of perimeters = scale factor = $\frac{9}{6} = \frac{3}{2}$

2. Given: $\angle D \cong \angle S$, $\angle B \cong \angle C$, $BP = 20$, $PD = 22$, $SZ = 11$, $SC = 11.5$

Triangles similar by AA~





Determine the following:

a) $CZ = 10$

b) $BD = 23$

$\frac{2}{1} = \frac{20}{x}$

$2x = 20$

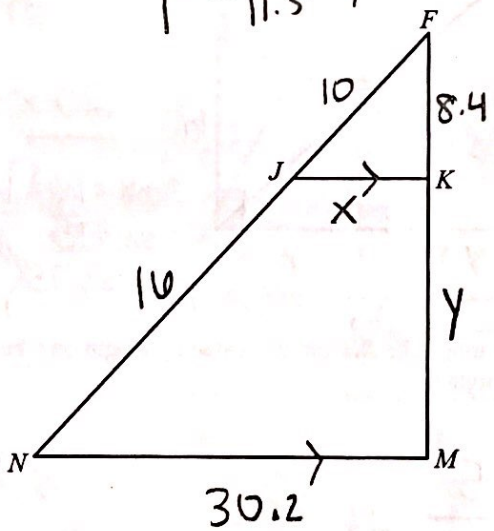
$x = 10$

$\frac{2}{1} = \frac{y}{11.5}$ $y = 23$

$\Delta DBP \sim \Delta SCZ$

Scale factor = $\frac{22}{11} = \frac{2}{1}$

3. Given: $\overline{JK} \| \overline{MN}$, $FJ = 10$, $FK = 8.4$, $JN = 16$, $MN = 30.2$



Determine the following:

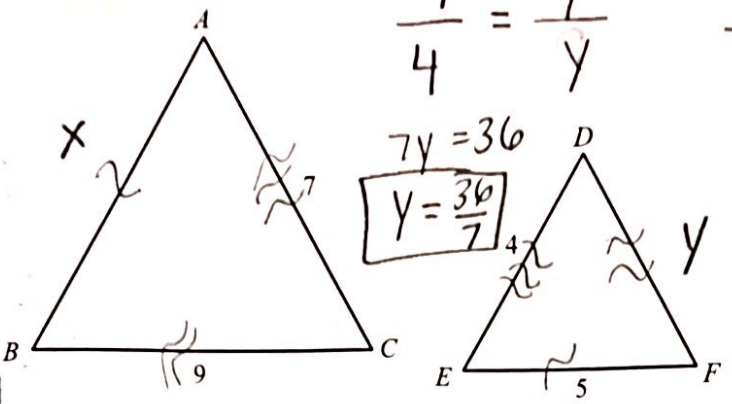
a) $JK = \frac{151}{13} = 11\frac{8}{13}$

b) $KM = 13.44$ or $\frac{336}{25}$

$\frac{10}{26} = \frac{x}{30.2}$ $302 = 26x$ $x = \frac{151}{13}$

$\frac{10}{16} = \frac{8.4}{y}$ $10y = 134.4$ $y = 13.44$

4. Given: $\Delta ABC \sim \Delta EFD$
Determine: DF and AB



Scale factor = $\frac{7}{4}$

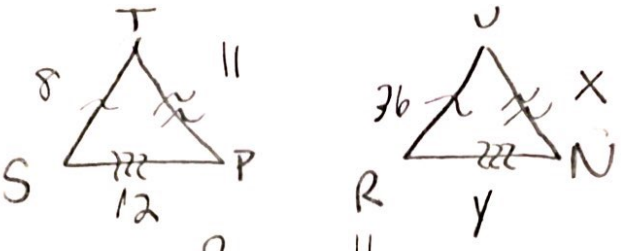
$DF = 36/7$

$AB = 8.75$ or $35/4$

$\frac{7}{4} = \frac{9}{y}$ → $7y = 36$ → $y = \frac{36}{7}$

$\frac{7}{4} = \frac{x}{5}$ → $35 = 4x$ → $x = 8.75$ or $35/4$

5. Given: $\Delta STP \sim \Delta RUN$
$SP = 12$
$ST = 8$
$TP = 11$
$RU = 36$
Determine: UN and RN



Scale factor = $\frac{8}{36} = \frac{2}{9}$

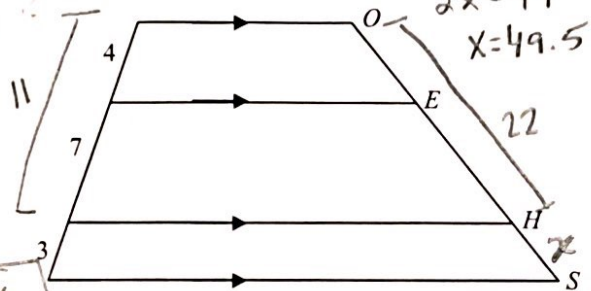
$UN = 49.5$

$RN = 54$

$\frac{2}{9} = \frac{11}{x}$ → $2x = 99$ → $x = 49.5$

$\frac{2}{9} = \frac{12}{y}$ → $2y = 108$ → $y = 54$

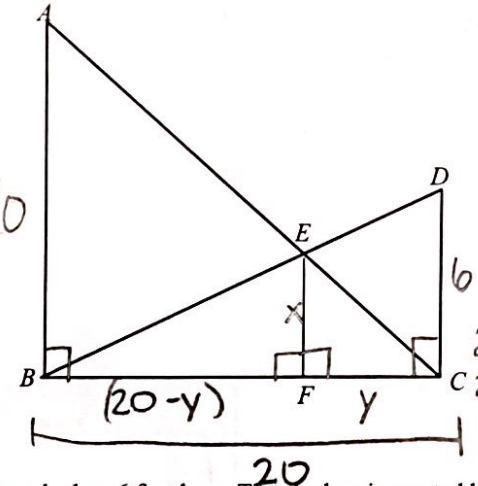
6. If $OH = 22$, find the value of HS.



$\frac{11}{3} = \frac{22}{x}$ → $66 = 11x$ → $6 = x$

$HS = 6$

7. Given: $\overline{AB} \perp \overline{CB}$
$\overline{DC} \perp \overline{CB}$
$\overline{EF} \perp \overline{CB}$
$AB = 10$
$DC = 6$
$BC = 20$
Determine: EF



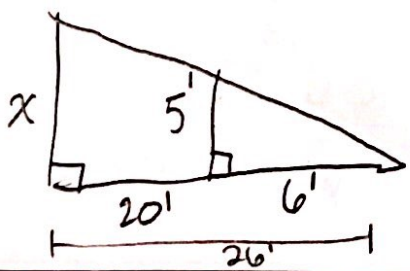
$EF = 3.75$

System: $\frac{x}{10} = \frac{y}{20}$ and $\frac{20-y}{20} = \frac{x}{6}$

$20x = 10y$ → $20x = 10(2y)$ → $20x = 75$ → $x = 3.75$

$120 - 6y = 20x$ → $10y = 120 - 6y$ → $16y = 120$ → $y = 7.5$

8. A fence post 5 feet high casts a shadow 6 feet long. The shadow is created by a light on a barn roof. The wall of the barn roof is 20 feet away from the fence post. How high is the light?



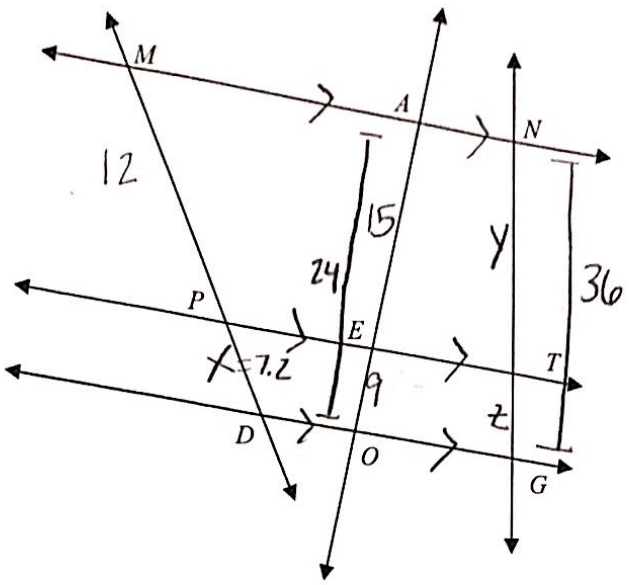
$\frac{5'}{6'} = \frac{x}{26'}$ → $\frac{130}{6} = \frac{6x}{6}$ → $x = \frac{65'}{3}$ or $21' 1''$

rounded to the nearest inch.

. Given: $\overleftrightarrow{MN} \| \overleftrightarrow{PT} \| \overleftrightarrow{DG}$

$MP = 12$
$AE = 15$
$EO = 9$
$NG = 36$

Determine the following:



a) PD

PD=7.2

$\frac{12}{x} = \frac{15}{9}$ $\quad 15x = 108$ $\quad x = 7.2$

b) NT

NT=22.5

$\frac{24}{15} = \frac{36}{y}$ $\quad 24y = 540$ $\quad y = 22.5$

c) TG

TG=13.5

$\frac{24}{9} = \frac{36}{z}$ $\quad 24z = 324$ $\quad z = 13.5$

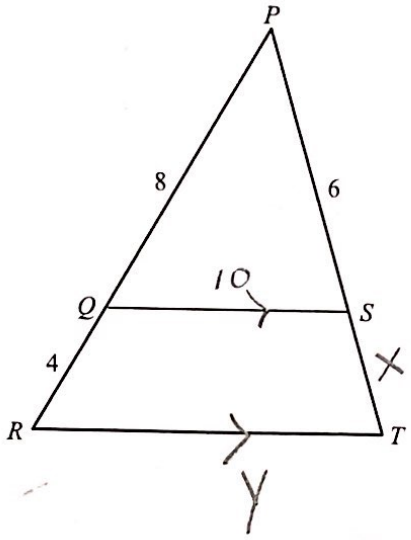
10. Given: $\overline{QS} \| \overline{RT}$

$PQ = 8$
$QR = 4$
$QS = 10$
$PS = 6$

Determine the following:

a) ST = 3

b) RT = 15



$\frac{8}{4} = \frac{6}{x}$ $\quad 8x = 24$ $\quad x = 3$

$\frac{8}{12} = \frac{10}{y}$ $\quad 8y = 120$ $\quad y = 15$

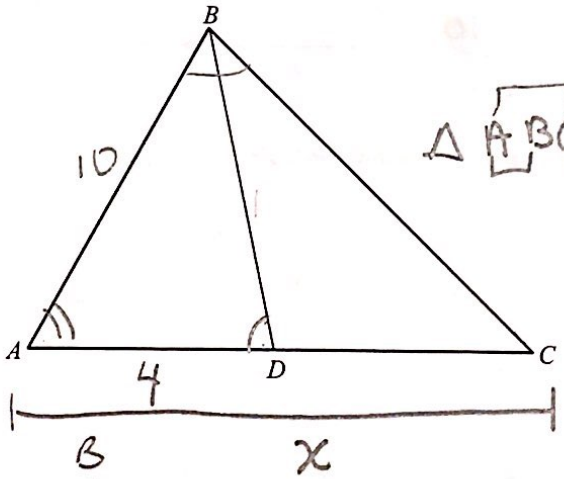
For numbers 11 & 12, use the figure below.

11. Given: $\angle ABC \cong \angle ADB$

$AB = 10$
$AD = 4$

Determine: AC

AC=25



$\triangle ABC \sim \triangle ADB$

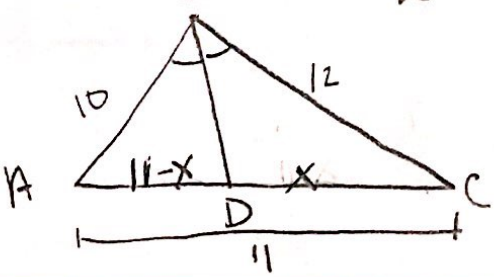
$\frac{x}{10} = \frac{10}{4}$ $\quad 4x = 100$ $\quad x = 25$

12. Given: $\angle ABD \cong \angle CBD$

$AB = 10$
$BC = 12$
$AC = 11$

Determine: DC

DC=6

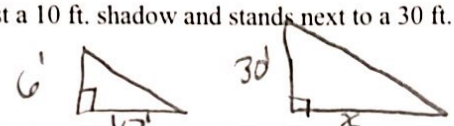


$\frac{10}{11-x} = \frac{12}{x}$ $\quad 10x = 132 - 12x$ $\quad 22x = 132$ $\quad x = 6$

13. If $\frac{8x}{5} = \frac{7y}{3}$, find the ratio of x to y.

$\frac{24x}{24} = \frac{35y}{24}$ $\quad \frac{x}{y} = \frac{35y}{24y}$ $\quad \frac{x}{y} = \frac{35}{24}$

14. If a 6 ft. pole cast a 10 ft. shadow and stands next to a 30 ft. pole, find the length of the second pole's shadow.

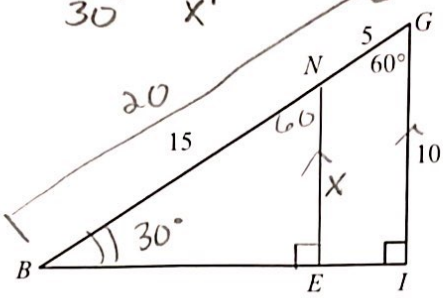


$\frac{6'}{30'} = \frac{10'}{x'}$ $\quad \frac{6x}{6} = \frac{300}{6}$ $\quad x = 50'$

15. ΔBIG is a dilation of ΔBEN. Find $m\angle B$ and the length of NE.

$180-90-60 = 30$

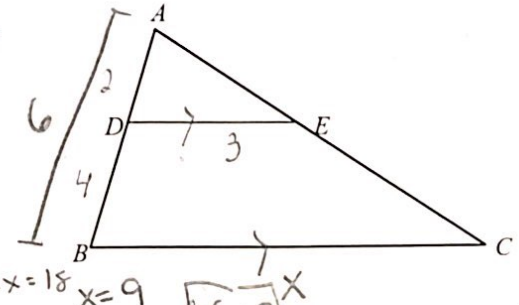
$m\angle B = 30°$



$\frac{x}{10} = \frac{15}{20}$ $\quad 20x = 150$ $\quad x = 7.5$

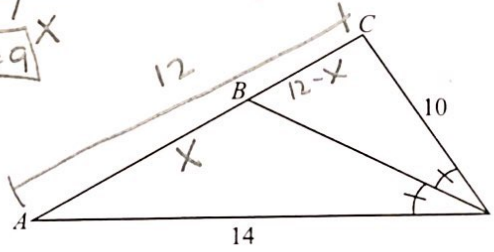
$NE = 7.5$

16. Given: $\overline{DE} \parallel \overline{BC}$
$AD = 2$
$DB = 4$
$DE = 3$
Find: BC



$\frac{2}{6} = \frac{3}{x}$ $\quad 2x = 18$ $\quad x = 9$ $\quad BC = 9$

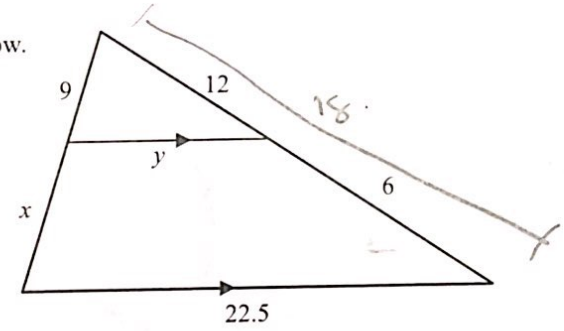
17. If $AC = 12$, find the value of AB.



$AB = 7$

$\frac{10}{12-x} = \frac{14}{x}$ $\quad 10x = 168 - 14x$ $\quad 24x = 168$ $\quad x = 7$

For numbers 18 & 19, use the diagram below.



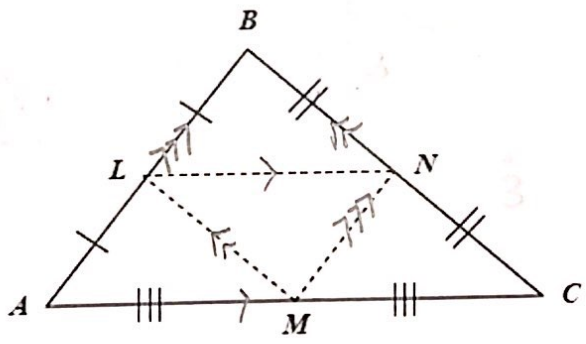
18. Find the value of x.

$\frac{9}{x} = \frac{12}{6}$ $\quad 12x = 54$ $\quad x = 4.5$

19. Find the value of y.

$\frac{y}{22.5} = \frac{12}{18}$ $\quad 18y = 270$ $\quad y = 15$

For numbers 20 – 27, consider the triangle below. In ΔABC, the midpoints of the sides are L, M, and N.



20. $\overline{LM} \parallel$? $\overline{BC}$

21. $\overline{AB} \parallel$? $\overline{MN}$

22. If $AC = 14$, then $LN =$? 7

23. If $MN = 8$, then $AB =$? 16

24. If $NC = 3$, then $LM =$? 3

25. If $LN = 5$, then ? $\overline{AC}$ $= 10$.

26. If $LM = 3x + 1$ and $BC = 10x - 6$, then $LM =$? 8.

$\frac{1}{2} = \frac{3x+1}{10x-6}$ $\quad 10x - 6 = 6x + 2$ $\quad 4x = 8$ $\quad x = 2$

27. If $NM = x - 1$ and $AB = 3x - 7$, then $AB =$?

$\frac{1}{2} = \frac{x-1}{3x-7}$ $\quad 3x - 7 = 2x - 2$ $\quad x = 5$