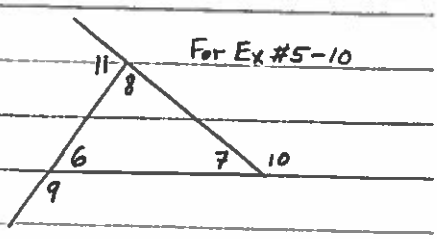
Key

A#26 p. 97-99 WE #5-16, 23-26, 29-32



5. $m\angle 6 + m\angle 7 + m\angle 8 = \boxed{180^\circ}$ [Δ sum Thm]

6. ① $m\angle 6 = 52^\circ$, $m\angle 11 = 82^\circ$ [Given]

② $m\angle 11 = m\angle 6 + m\angle 7$ [Ext. $\angle$ of a Δ Thm]

③ $82 = 52 + m\angle 7$ [Subst. Prop. of = (① → ②)]

④ $\boxed{m\angle 7 = 30^\circ}$ [Subtr. Prop. of = / Symmetric Prop. of =]

7. ① $m\angle 6 = 55^\circ$, $m\angle 10 = 150^\circ$ [Given]

② $m\angle 10 = m\angle 8 + m\angle 6$ [Ext. $\angle$ of a Δ Thm]

③ $150 = m\angle 8 + 55$ [Subst. Prop. of = (① → ②)]

④ $\boxed{m\angle 8 = 95^\circ}$ [Subtr. Prop. of = / Symm. Prop. of =]

8. ① $m\angle 6 = x$, $m\angle 7 = x - 20$, $m\angle 11 = 80$ [Given]

② $m\angle 11 = m\angle 6 + m\angle 7$ [Ext. $\angle$ of a Δ Thm]

③ $80 = x + x - 20$ [Subst. Prop. of = (① → ②)]

$80 = 2x - 20$

$2x = 100$

$\boxed{x = 50}$

9. ① $m\angle 8 = 4x$, $m\angle 7 = 30$, $m\angle 9 = 6x - 20$ [Given]

② $m\angle 9 = m\angle 8 + m\angle 7$ [Ext. $\angle$ of a Δ Thm]

③ $6x - 20 = 4x + 30$ [Subst. Prop. of = (① → ②)]

$2x = 50$

$\boxed{x = 25}$

10. ① $m\angle 9 + m\angle 6 = 180^\circ$ [$\angle$ Add Post]

$m\angle 10 + m\angle 7 = 180^\circ$

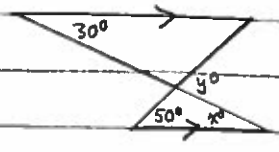
$m\angle 11 + m\angle 8 = 180^\circ$

② $m\angle 9 + m\angle 10 + m\angle 11 + m\angle 6 + m\angle 7 + m\angle 8 = 540^\circ$ [Add Prop of = (1+1+1)]

③ $m\angle 6 + m\angle 7 + m\angle 8 = 180^\circ$ [Δ Sum Thm]

④ $\boxed{m\angle 9 + m\angle 10 + m\angle 11 = 360^\circ}$ [Subtr. Prop. of = (2 − 3)]

11.



① $\boxed{x = 30}$ [Alt. Int. $\angle$s Thm]

② $y = x + 50$ [Ext. $\angle$ of a Δ Thm]

$y = 30 + 50$

$\boxed{y = 80}$

A#26 continued

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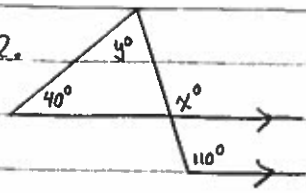
Key

12.



① $x = 110$ [Con. $\angle$s Post.]

② $x = y + 40$ [Ext. $\angle$ of a $\triangle$ Thm]

$110 = y + 40$

$y = 70$

13.

$x + 50 = 90°$

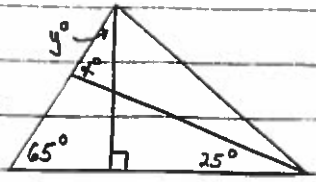
① $x = 40$ [The acute $\angle$s of a rt. $\triangle$ are comp.]

③ $x + y = 90$ [Ext. Sides $\perp$ → adj. comp. $\angle$s]

$y = 50$

② $\perp$ [$\perp$ Transversal Thm]

14.



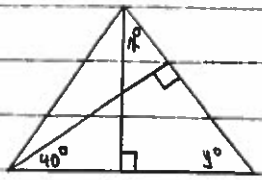
① $x = 25 + 65$ [Ext. $\angle$ of a $\triangle$ Thm]

$x = 90$

② $y + 65 = 90$ [The acute $\angle$s of a rt. $\triangle$ are comp.]

$y = 25$

15.



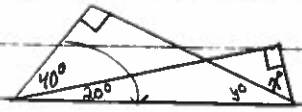
① $y + 40 = 90°$ [The acute $\angle$s of a rt. $\triangle$ are comp.]

$y = 50$

② $x + y = 90°$ [The acute $\angle$s of a rt. $\triangle$ are comp.]

$x = 40$

16.



① $60°$ [$\angle$ Add Post]

② $y + 60 = 90$ [The acute $\angle$s of a rt. $\triangle$ are comp.]

$y = 30$

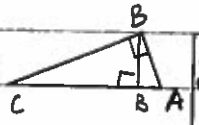
③ $(x + y) + 20 = 90$ [The acute $\angle$s of a Rt $\triangle$ are comp.]

$x + 30 + 20 = 90$

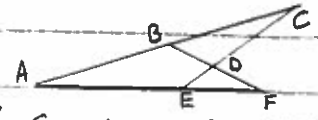
$x = 40$

23. Given: $\overline{AB} \perp \overline{BC}$; $\overline{BD} \perp \overline{AC}$

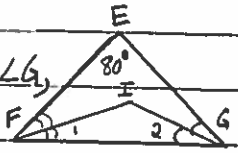
Prove: $m\angle ABD = m\angle C$



Statements	Reasons
① $\overline{AB} \perp \overline{BC}$; $\overline{BD} \perp \overline{AC}$	① Given
② $\angle C$ is comp. to $\angle A$; $\angle A$ is comp. to $\angle ABD$	② The acute $\angle$s of a Rt $\triangle$ are Comp.
③ $\angle ABD \cong \angle C$	③ $\cong$ Complements Thm
④ $m\angle ABD = m\angle C$	④ Def. of $\cong$ $\angle$s



24. Given: $\overline{FI}$ and $\overline{GI}$ bisect $\angle F$ and $\angle G$, $m\angle E = 80°$



Prove: $m\angle FIG = 130°$

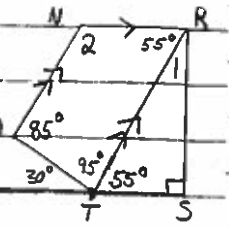
Statements	Reasons
① $\overline{FI}$ and $\overline{GI}$ bisect $\angle F$ and $\angle G$, $m\angle E = 80°$	[Given]
② $m\angle 1 + m\angle 2 + m\angle FIG = 180°$ ($m\angle F + m\angle G + m\angle E = 180°$)	[$\triangle$ sum Thm]
③ $m\angle F + m\angle G = 100°$	[Subst. Prop. of = (2-1)]
④ $\frac{1}{2} m\angle F + \frac{1}{2} m\angle G = 50°$	[Div. Prop. of =]
⑤ $m\angle 1 = \frac{1}{2} m\angle F$, $m\angle 2 = \frac{1}{2} m\angle G$	[$\angle$ bisector Thm #I]
⑥ $m\angle 1 + m\angle 2 = 50°$	[Subst. Prop. of = (5 → 4)]
⑦ $m\angle FIG = 130°$	[Subst. Prop. of = (2-6)]

25. Given: $\angle ABD \cong \angle AED$

Prove: $\angle C \cong \angle F$

Statements	Reasons
① $\angle ABD \cong \angle AED$	① Given
② $\angle A \cong \angle A$	② Refl. Prop. of $\cong$
③ $\angle C \cong \angle F$	③ 3rd $\angle$s Thm

26.



① $m\angle MTR = 95°$ [S.S. Int. $\angle$s Thm]

② $m\angle RTS = 55°$ [$\angle$ Add Post]

③ $m\angle 1 = 35°$ [The acute $\angle$s of a rt. $\triangle$ are comp.]

④ $m\angle URT = 55°$ [Alt. Int. $\angle$s Thm]

⑤ $m\angle 2 = 125°$ [S.S. Int. $\angle$s Thm]

A#26 continued

Key

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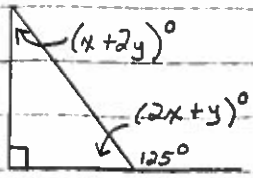
29.



① $x+2y+2x+y=90$ [The acute $\angle$s of a rt $\triangle$ are comp.] ② $2x+y+125=180^\circ$ [$\angle$ Add Post]

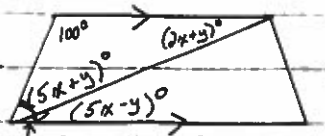
$3x+3y=90$

$x+y=30$ $\xrightarrow{\times(-1)}$ $-x+(-y)=-30$

$2x+y=55$

$x=25$ $\rightarrow$ $y=5$

30.



① $10x^\circ$ [$\angle$ Add Post] ② $10x+100=180$ [S.S. Int. $\angle$s Thm] ③ $3x+y=5x-y$ [Alt. Int. $\angle$s Thm]

$10x=80$

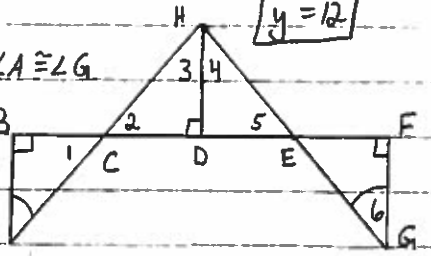
$x=8$

$16+y=40-y$

$2y=24$

$y=12$

31. Given: $\overline{AB}\perp\overline{BF}$; $\overline{HD}\perp\overline{BF}$; $\overline{GF}\perp\overline{BF}$; $\angle A\cong\angle G$



① $\overline{AB}\parallel\overline{HD}\parallel\overline{FG}$ [In a plane, 2 lines $\perp$ to the same line are $\parallel$]

② $\angle A\cong\angle 3$, $\angle 6\cong\angle 4$ [Alt. Int. $\angle$s Thm]

* ③ $\angle 3\cong\angle 4\cong\angle 6$ [Trans. Prop. of $\cong$]

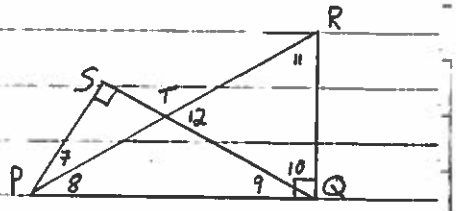
④ $\angle CDH\cong\angle EDH$ [$\perp$ lines form $\cong$ adj. $\angle$s]

⑤ $\angle 2\cong\angle 5$ [3rd $\angle$s Thm] → Look at $\triangle CDH$ and $\triangle EDH$!

⑥ $\angle 1\cong\angle 2$ [Vert. $\angle$s Thm]

* ⑦ $\angle 1\cong\angle 2\cong\angle 5$ [Trans. Prop. of $\cong$]

32. Given: $\overrightarrow{PR}$ bisects $\angle SPQ$; $\overline{PS}\perp\overline{SQ}$; $\overline{RQ}\perp\overline{PQ}$



* ① $\angle 7\cong\angle 8$ [Def. of $\angle$ bisector]

② $\angle S$ and $\angle PQR$ are Right $\angle$s [Def. of $\perp$]

③ $\angle S\cong\angle PQR$ [Right $\angle$s Thm]

④ $\angle STP\cong\angle 11$ [3rd $\angle$s Thm] → Look at $\triangle PST$ and $\triangle PQR$!

⑤ $\angle STP\cong\angle 12$ [Vert. $\angle$s Thm]

* ⑥ $\angle 11\cong\angle 12$ [Trans. Prop. of $\cong$]