Mr. Hansen
HW due 10/14/2008

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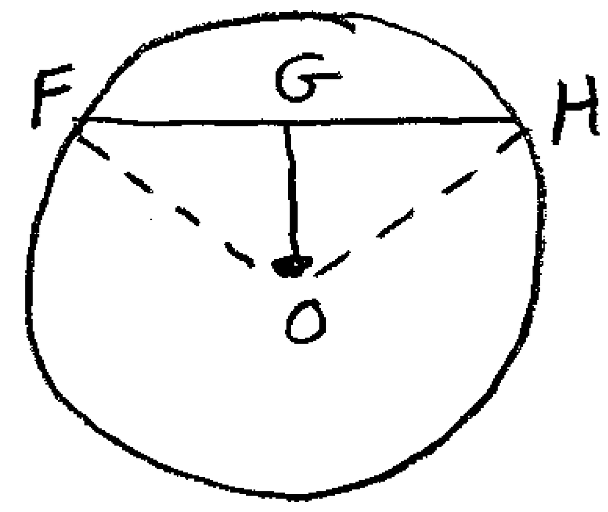
pp. 162–164

3. Given: $\odot O$

$\overline{OG} \perp \overline{FH}$

Prove: $\overline{FG} \cong \overline{GH}$



1. $\odot O$	1. G
2. $\overline{OG} \perp \overline{FH}$	2. G
3. Construct $\overline{OF}$, $\overline{OH}$	3. Two pts. det. a line
4. $\angle OGF$, $\angle OGH$ are rt.	4. Def. $\perp$
5. $\triangle OGF$, $\triangle OGH$ are rt.	5. Def. of rt. $\triangle$
6. $\overline{OF} \cong \overline{OH}$	6. Radii of a $\odot$ are $\cong$
7. $\overline{OG} \cong \overline{OG}$	7. Refl.
8. $\triangle OGF \cong \triangle OGH$	8. HL (5, 6, 7)
9. $\overline{FG} \cong \overline{GH}$	9. CPCTC

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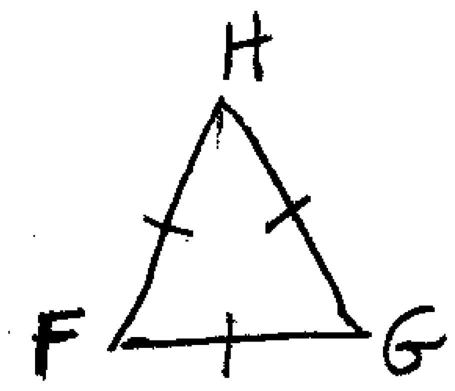
7. Given: $\triangle HGF$ is equilat.



a) $m\angle F = m\angle H$ by ITT

$x + 32 = 2x + 4$

$28 = x$

$m\angle G = m\angle F = x + 32 = 28 + 32 = 60$

Note: All 3 angles are $60°$ since for triangles, equilat. $\Leftrightarrow$ equiangular.

b) perim. $= 3HG$

$6y + 24 = 3(3y - 7)$

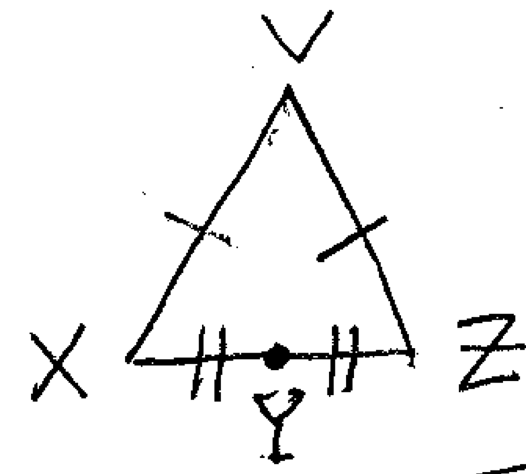
$6y + 24 = 9y - 21$

$45 = 3y$

$y = 15 \Rightarrow$ perim. $= 6y + 24 = 6(15) + 24 = 114$

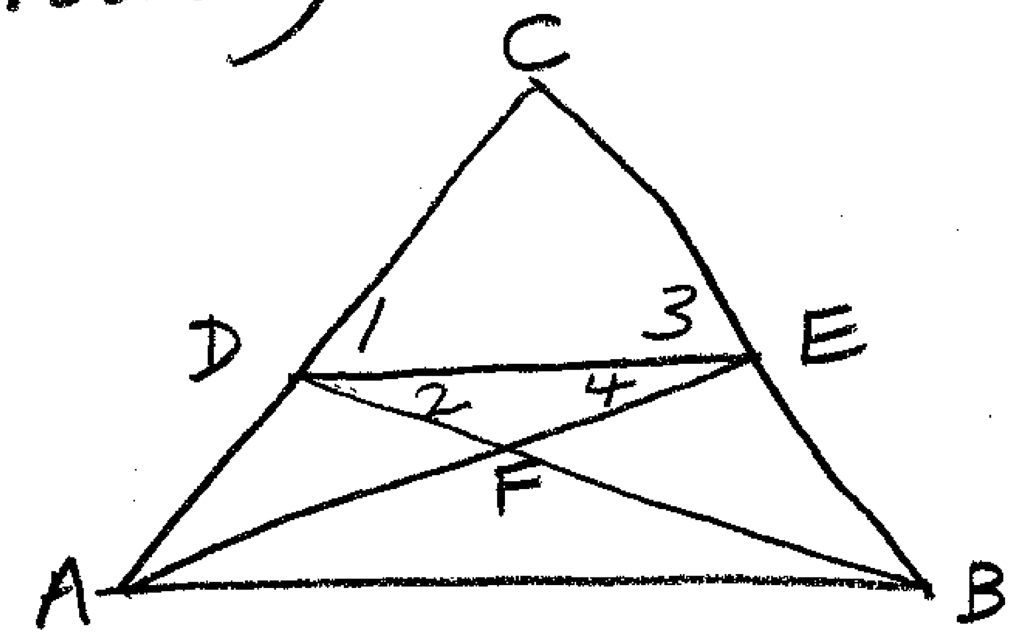
14. A very sneaky problem!

These are the only givens:



Since all the givens of the problem are shown here, points W and A are "free to roam." It cannot be proved that $\overline{WY} \cong \overline{YA}$.

18. This is an <u>excellent</u> problem. Try to work as much of it as possible without looking ahead in the proof.



Given: $\overline{AC} \cong \overline{BC}$
$\angle 1 \cong \angle 3$

Prove: $\triangle DFE$ is isosceles

First, some forward chaining:

$\angle 1 \cong \angle 3 \Rightarrow DC = EC$ by ITT

$\therefore$ $AC = BC$ (given) $\Rightarrow AD = BE$ by subtraction

Now, some backward chaining:

The conclusion would be easy if we could show $\underline{\angle 2 \cong \angle 4}$ (pre-goal), which in turn would be easy if we could show $\underline{\triangle AED \cong \triangle BDE}$ (pre-pre-goal).

The hard part is figuring out how to prove $\triangle AED \cong \triangle DBE$. Struggle with this before peeking ahead!

OK, we have to assume that you either peeked (in which case you may have trouble in a testing situation) or <u>struggled</u> and found the resources within yourself to see the necessary path: SAS. If the latter is true, then congratulations! Doesn't it feel good?

You see, $\overline{DE} \cong \overline{DE}$ (refl.), $\angle ADE \cong \angle BED$ (both supp. to $\angle 1$ or $\angle 3$, which are $\cong$), and $\overline{AD} \cong \overline{BE}$ by the forward chaining from above. We need only write this up:

1. $\overline{AC} \cong \overline{BC}$	1. G
2. $\angle 1 \cong \angle 3$	2. G
3. $\overline{DC} \cong \overline{EC}$	3. ITT ($\triangle \Rightarrow \triangle$)
4. $\overline{AD} \cong \overline{BE}$	4. Subtr. Prop. (1, 3)
5. $\angle ADE$ supp. $\angle 1$, $\angle BED$ supp. $\angle 3$	5. Diag.
6. $\angle ADE \cong \angle BED$	6. Supps. of $\cong$ $\angle$s are $\cong$
7. $\overline{DE} \cong \overline{DE}$	7. Refl.
8. $\triangle ADE \cong \triangle BDE$	8. SAS (4, 6, 7)
9. $\angle 4 \cong \angle 2$	9. CPCTC
10. $\triangle DFE$ is isosceles	10. ITT ($\triangle \Rightarrow \triangle$)

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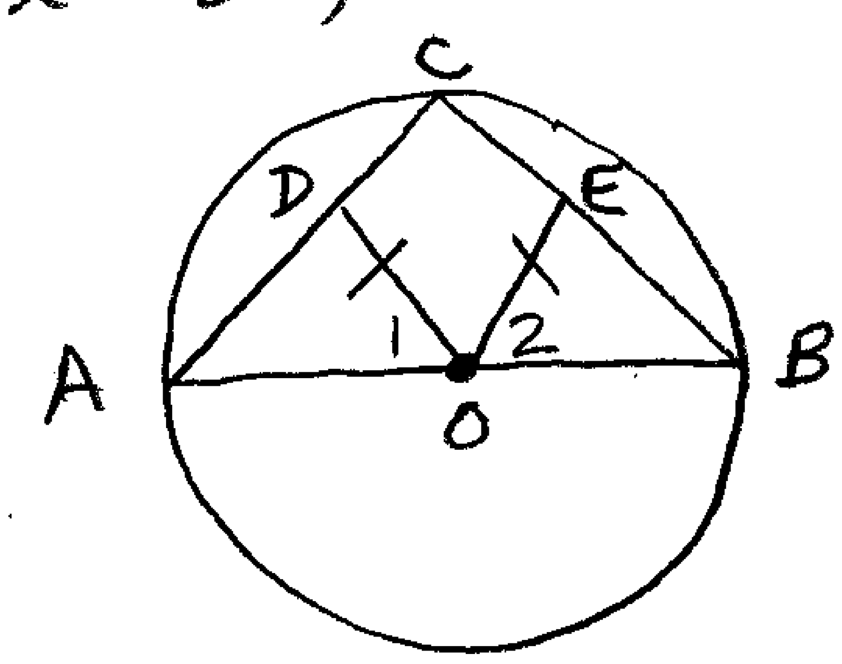
18. Let x = measure of unknown $\angle$
$90-x$ = " " " $\angle$'s comp.
$180-x$ = " " " $\angle$'s supp.

$$180 - x = 40 + 2(90-x)$$
$$180 - x = 40 + 180 - 2x$$
$$-x = 40 - 2x$$
$$x = 40 \Rightarrow 90 - x = 50, \text{ half of which is } 25$$

23. Given: $\odot O$
$\overline{OD} \cong \overline{OE}$
$\angle DOB \cong \angle EOA$

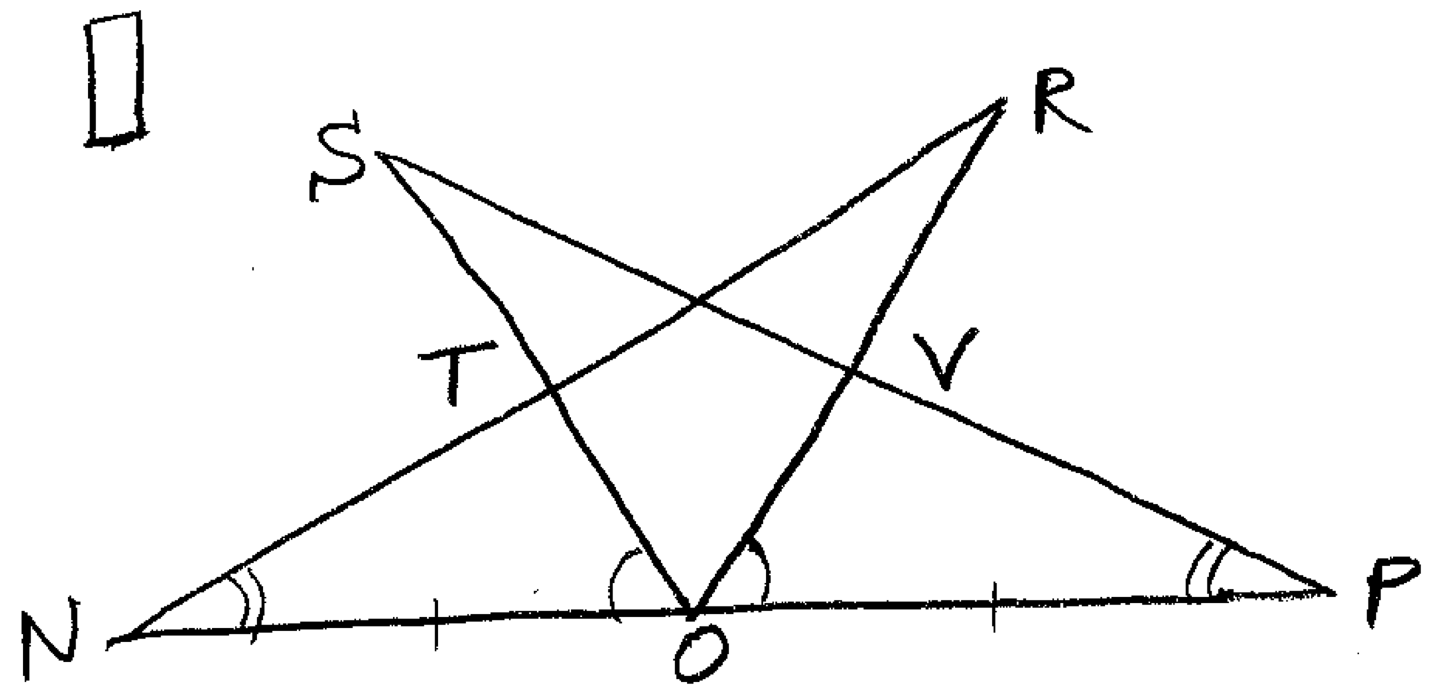
Prove: $\overline{CD} \cong \overline{CE}$



First, some forward chaining: $\overline{AO} \cong \overline{OB}$ (radii), and $\angle 1 \cong \angle 2$ by subtraction. That means $\triangle DOA \cong \triangle EOB$ by SAS. The rest follows if you use CPCTC twice and apply subtraction. Think it through before you turn the page...

Statements	Reasons
1. $\odot O$	1. G
2. $\overline{OA} \cong \overline{OB}$	2. Radii of a $\odot$ are $\cong$
3. $\angle DOB \cong \angle EOA$	3. G
4. $\angle DOE \cong \angle DOE$	4. Refl.
5. $\angle 1 \cong \angle 2$	5. Subtr. Prop. (3, 4)
6. $\overline{OD} \cong \overline{OE}$	6. G
7. $\triangle DOA \cong \triangle EOB$	7. SAS (2, 5, 6)
8. $\overline{AD} \cong \overline{BE}$	8. CPCTC
9. $\angle A \cong \angle B$	9. CPCTC
10. $\overline{AC} \cong \overline{BC}$	10. ITT ($\triangle \Rightarrow \triangle$)
11. $\overline{CD} \cong \overline{CE}$	11. Subtr. Prop. (10, 8)

24. Given: $\angle NOT \cong \angle POV$
O mdpt. $\overline{NP}$
$\angle N \cong \angle P$
Prove: $\overline{ST} \cong \overline{RV}$



Statements	Reasons
1. $\angle NOT \cong \angle POV$	1. G
2. O mdpt. $\overline{NP}$	2. G
3. $\overline{ON} \cong \overline{OP}$	3. Def. mdpt.
4. $\angle N \cong \angle P$	4. G
5. $\triangle NOT \cong \triangle POV$	5. ASA (1, 3, 4)
6. $\overline{OT} \cong \overline{OV}$	6. CPCTC
7. $\angle SOR \cong \angle SOR$	7. Refl.
8. $\angle NOR \cong \angle POS$	8. Add. Prop. (1, 7)
9. $\triangle NOR \cong \triangle POS$	9. ASA (4, 3, 8)
10. $\overline{OS} \cong \overline{OR}$	10. CPCTC
11. $\overline{ST} \cong \overline{RV}$	11. Subtr. Prop. (10, 6)