Mr. Hansen
Geom. HW due 9/15/08

§1.8 #2,4,5,9; §1.9 #1-5, 12

§1.8

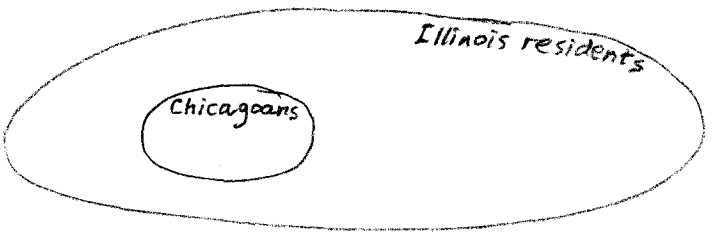
2. a) If ea. side of a Δ has length 10, then perim. = 30. (TRUE)

CONVERSE: If perim. of $\Delta = 30$, then ea. side has length 10. (FALSE)
INVERSE: If at least one side of a Δ has length $\neq 10$, then perim. $\neq 30$. (FALSE)
CONTRAPOSITIVE: If perim. of $\Delta \neq 30$, then at least one side has length $\neq 10$. (TRUE)

b) If an $\angle$ is acute, then its measure is >0 and <90. (TRUE)

CONVERSE: If meas. of an $\angle$ is >0 and <90, then the $\angle$ is acute. (TRUE)
INVERSE: If an $\angle$ is not acute, then its measure is ≤ 0 or ≥ 90. (TRUE)
CONTRAPOSITIVE: If meas. of an $\angle$ is ≤ 0 or >90, then the $\angle$ is not acute. (TRUE)

4.



(Everyone who lives in Chicago lives in Illinois.)

$C \Rightarrow I$

a) Penny in Chicago $\overset{?}{\Rightarrow}$ Penny in IL? (TRUE)

b) Benny in IL $\overset{?}{\Rightarrow}$ Benny in Chicago? (FALSE) (He could live in Peoria.)

c) Kenny not in Chicago $\overset{?}{\Rightarrow}$ Kenny in IL? (FALSE) (He could live in Los Angeles.)

d) Denny not in IL $\overset{?}{\Rightarrow}$ Denny in Chicago? (FALSE) (He could live in New York.)

5. a) Given: $\begin{cases} a \Rightarrow b \\ d \Rightarrow \sim c \\ \sim c \Rightarrow a \\ b \Rightarrow f \end{cases}$

Start with d: $d \Rightarrow \sim c \Rightarrow a \Rightarrow b \Rightarrow f$

Conclusion: $d \Rightarrow f$

Or, start with $\sim f$: $\sim f \Rightarrow \sim b \Rightarrow \sim a \Rightarrow c \Rightarrow \sim d$

Conclusion: $\sim f \Rightarrow \sim d$ [equivalent to the other answer]

b) Given: $\begin{cases} p \Rightarrow \sim q \\ r \Rightarrow q \\ s \Rightarrow r \end{cases}$

Start with p: $p \Rightarrow \sim q \Rightarrow \sim r \Rightarrow \sim s$

Conclusion: $p \Rightarrow \sim s$

Or, start with s: $s \Rightarrow r \Rightarrow q \Rightarrow \sim p$

Conclusion: $s \Rightarrow \sim p$ [equivalent to the other answer]

c) Let W = event that weasels walk wisely
C = " " cougars call their cubs
G = " " goats go to graze
H = " " horses head for home
B = " " bobcats begin to browse

Given: $W \Rightarrow C$
$G \Rightarrow H$
$C \Rightarrow G$
$B \Rightarrow W$

Start with B: $B \Rightarrow W \Rightarrow C \Rightarrow G \Rightarrow H$

Conclusion: When bobcats begin to browse, horses head for home.

↑ or "if" [since "if" and "when" are logically equivalent]

Or, start with $\sim H$: $\sim H \Rightarrow \sim G \Rightarrow \sim C \Rightarrow \sim W \Rightarrow \sim B$

Conclusion: If horses are not heading for home, bobcats are not beginning to browse.

[contrapositive of first answer, hence equivalent]

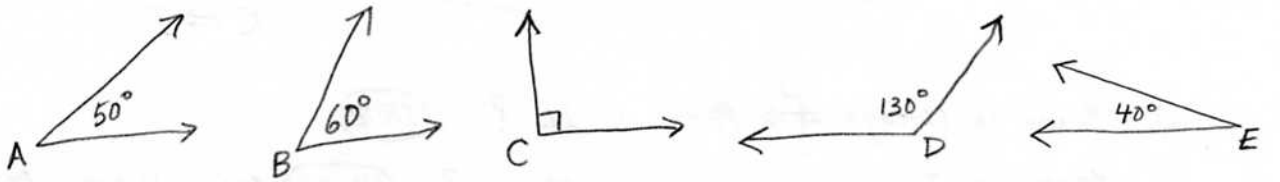
9. Given: $\sim c \Rightarrow \sim f$, $g \Rightarrow b$, $p \Rightarrow f$, $c \Rightarrow \sim b$

Start with g: $g \Rightarrow b \Rightarrow \sim c \Rightarrow \sim f \Rightarrow \sim p$

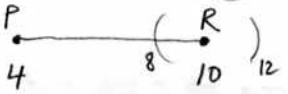
Conclusion: $g \Rightarrow \sim p$

Or, start with p: $p \Rightarrow f \Rightarrow c \Rightarrow \sim b \Rightarrow \sim g$

Conclusion: $p \Rightarrow \sim g$ [equivalent to other answer]



§1.9

1. $P(\text{acute } \angle) = P(\angle A, \angle B, \text{or } \angle E) = \frac{3}{5}$
2. $P(\text{right } \angle) = P(\angle C) = \frac{1}{5}$
3. $P(\text{obtuse } \angle) = P(\angle D) = \frac{1}{5}$
4. $P(\text{straight } \angle) = 0$ (not possible with the 5 given $\angle$s)
5. 

Let $P = 4$, $R = 10$, q = number line coordinate of random point Q

$$P(8 < q < 12 \text{ and } Q \in \overline{PR}) = \frac{2}{PR} = \frac{2}{10-4} = \frac{2}{6} = \frac{1}{3}$$

12. $P(\text{neither } \angle \text{ is acute when 2 are chosen from } \angle A \text{ through } \angle E \text{ above})$
$= P(\{\angle C, \angle D\}) = \frac{1}{10}$ since there are 10 ways to select 2 $\angle$s:
$\{\angle A, \angle B\}, \{\angle A, \angle C\}, \{\angle A, \angle D\}, \{\angle A, \angle E\}, \{\angle B, \angle C\}, \{\angle B, \angle D\}, \{\angle B, \angle E\}, \{\angle C, \angle D\},$
$\{\angle C, \angle E\}$, or $\{\angle D, \angle E\}$

NOTE: In "sets," order is irrelevant. However, we get the same answer if order is considered to be relevant. AB, BA, AC, CA, AD, DA, AE, EA, BC, CB, BD, DB, BE, EB, (CD), (DC), CE, EC, DE, ED. 2 winners (circled) in 20 chances = $\frac{1}{10}$