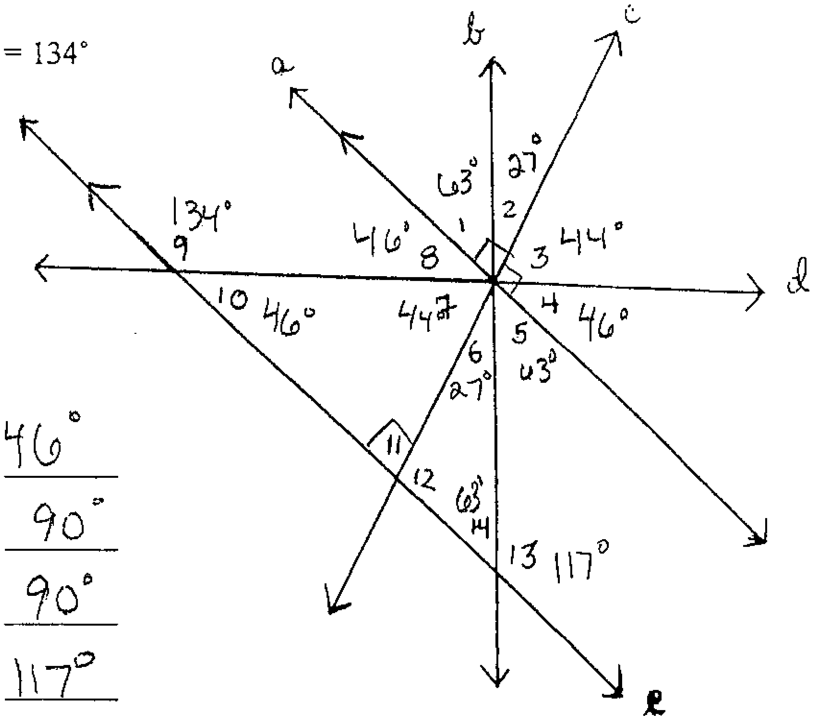
Geometry Honors
Worksheet—Sections 3-1, 3-2, 3-3

Name Key

$\angle 134 = 1 + 2 + 3$

1. $a \parallel e$, $c \perp e$, $m\angle 5 = 63°$, $m\angle 9 = 134°$



$m\angle 1 =$ 63°

$m\angle 2 =$ 27°

$m\angle 3 =$ 44°

$m\angle 4 =$ 46°

$m\angle 5 =$ 63°

$m\angle 6 =$ 27°

$m\angle 7 =$ 44°

$m\angle 8 =$ 46°

$m\angle 10 =$ 46°

$m\angle 11 =$ 90°

$m\angle 12 =$ 90°

$m\angle 13 =$ 117°

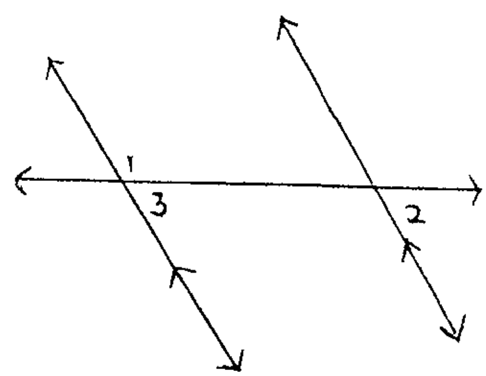
2. Complete each statement with always, sometimes, or never.

a. Two lines that have no points in common are sometimes parallel.

b. If a line is perpendicular to one of two parallel lines, then it is always perpendicular to the other one.

c. If two lines are cut by a transversal, and same-side interior angles are complementary, then the lines are never parallel.

3. Find the measures of the angles.



a. $m\angle 1 = 3x - 20$ $m\angle 2 = x$

$3x - 20 + x = 180$
$4x - 20 = 180$
$4x = 200$
$x = 50$

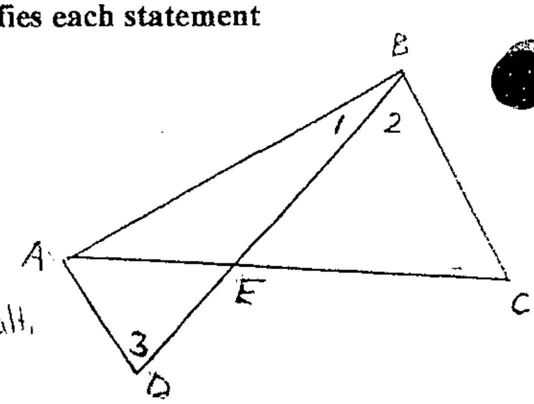
$m\angle 1 =$ 130° $m\angle 2 =$ 50°

b. $m\angle 2 = 2x + 12$ $m\angle 3 = 4(x - 7)$

$m\angle 2 =$ 52° $m\angle 3 =$ 52°

$2x + 12 = 4(x - 7)$
$2x + 12 = 4x - 28$
$40 = 2x$
$20 = x$

Name or state the postulate, definition or theorem that justifies each statement about the diagram.



4. a. $\angle AED \cong \angle BEC$ Vert. $\angle^s$ $\cong$

b. AE + EC = AC seg. addn. post.

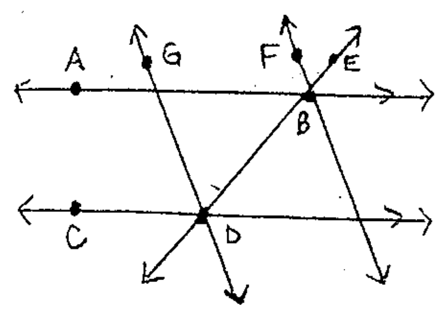
c. $m\angle 1 + m\angle 2 = m\angle ABC$ $\angle$ addn. post.

d. If $\angle 2 \cong \angle 3$, then $\overline{AD} \parallel \overline{BC}$ If 2 lines cut by tr. + alt. int. $\angle^s$ $\cong$, then lines $\parallel$

e. If $\overline{DA} \perp \overline{AB}$, then $\angle DAB$ is a right angle Def. $\perp$

f. If $\angle ABC$ is a right angle, then $\overline{AB} \perp \overline{BC}$ Def. $\perp$

5.



Given: $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, $\overrightarrow{BF}$ bisects $\angle ABE$,
$\overrightarrow{DG}$ bisects $\angle CDB$

Prove: $\overrightarrow{BF} \parallel \overrightarrow{DG}$

Statements	Reasons
1. $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$	1. Given
2. $\angle CDE \cong \angle ABE$	2. If $\parallel$ lines cut by tr., then corr. $\angle^s$ $\cong$
3. $m\angle CDE = m\angle ABE$	3. def. $\cong$
4. $\overrightarrow{BF}$ bisects $\angle ABE$	4. Given
$\overrightarrow{DG}$ bisects $\angle CDB$	
5. $m\angle FBE = \frac{1}{2} m\angle ABE$	5. $\angle$ bis. Theorem
$m\angle GDE = \frac{1}{2} m\angle CDE$.	
6. $\frac{1}{2} m\angle ABE = \frac{1}{2} m\angle CDE$	6. Mult. prop. =
7. $m\angle FBE = m\angle GDE$	7. Substitution
8. $\angle FBE \cong \angle GDE$	8. def. $\cong$
9. $\overrightarrow{BF} \parallel \overrightarrow{DG}$	9. If 2 lines cut by tr. + Corr. $\angle s$ $\cong$, then lines $\parallel$