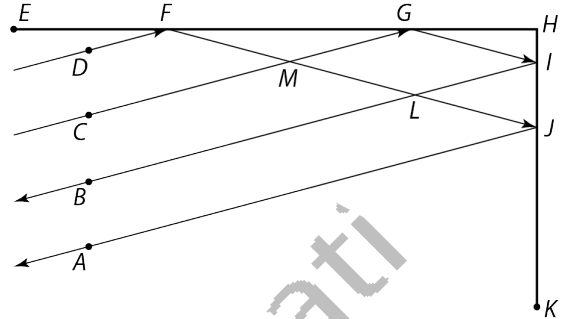




# ANGLE PAIRS & PROOFS

## Mastery Check

$\overline{EH}$  and  $\overline{HK}$  represent two perpendicular mirrors.  
 $\overline{DF}$  and  $\overline{CG}$  show two parallel light rays that reflect off the mirrors so that  $\overline{DF} \parallel \overline{CG} \parallel \overline{IB} \parallel \overline{JA}$  and  $\overline{FJ} \parallel \overline{GI}$ . When light reflects, the angle of reflection is congruent to the angle at which the light strikes the surface. For example,  $\angle EFD \cong \angle GFM$ .



1. What postulate, property, or theorem tells us that  $EF + FG = EG$ ?
2. Name a postulate and a property that together justify saying that if  $m\angle EFD = m\angle GFM$ , then  $m\angle EFM = m\angle GFD$ .
3. Write the Linear-Pair Postulate using  $\angle FMC$ .
4. We know that  $\overline{CM} \parallel \overline{BL}$ , but how do we know that there is not some other line parallel to  $\overline{BL}$  that goes through point  $M$ ?
5. What postulate would allow us to construct a line through  $A$  and  $G$  and know that there are no other possible lines that pass through these two points?
6. What postulate, property, or theorem tells us that  $\angle FMC \cong \angle LJA$ ?
7. (a) If  $m\angle CML = 145^\circ$ , what is  $m\angle AJM$ ? (b) What theorem allowed you to figure that out?
8. If  $m\angle MLB = 32^\circ$ , what is  $m\angle GIH$ ?
9. If  $m\angle CML = 8x - 5$  and  $m\angle ILM = 6x + 32$ , what is  $m\angle LJA$ ?

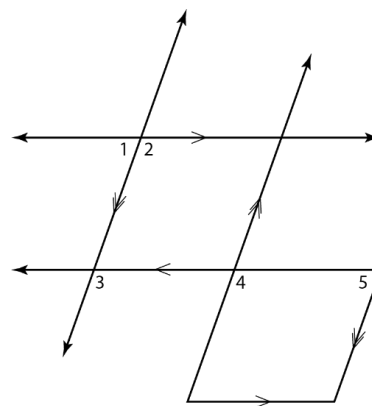
10. Two parallel lines are intersected by a transversal. A pair of same-side-interior angles measure  $18x - 2y^\circ$  and  $2x + 6y^\circ$ . A pair of alternate-exterior angles measure  $9y + 1^\circ$  and  $5x + 6^\circ$ . Find the values of  $x$  and  $y$ .

11. Two parallel lines are intersected by a transversal. A pair of corresponding angles measure  $x^2 - 2x - 6^\circ$  and  $8x + 18^\circ$ . What are the measures of the angles in degrees?

**Given:** Lines are parallel as shown.

**Prove:**  $m\angle 1 = m\angle 5$

**Directions:** Fill in the reasons to justify each of the statements

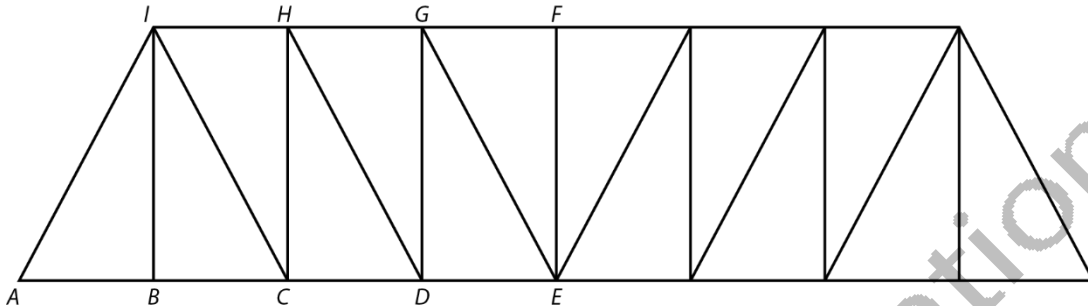


STATEMENT	REASON
Lines are parallel as shown.	given
$m\angle 1 + m\angle 2 = 180^\circ$	12.
$m\angle 2 = m\angle 3$ and $m\angle 3 = m\angle 4$	13.
$m\angle 2 = m\angle 4$	14.
$m\angle 1 + m\angle 4 = 180^\circ$	15.
$m\angle 5 + m\angle 4 = 180^\circ$	16.
$m\angle 1 + m\angle 4 = m\angle 5 + m\angle 4$	17.
$\therefore m\angle 1 = m\angle 5$	18.



# ANGLE PAIRS & PROOFS 1

## Progress Check



1. If  $\angle ICD \cong \angle HDE$ , what postulate allows us to say that  $\overline{IC} \parallel \overline{HD}$ ?
2. If  $AB = CD$ , what property tells us that  $AB + BC = BC + CD$ ?
3. What postulate allows us to conclude in the previous problem that  $AC = BD$ ?
4. What postulate allows us to write  $m\angle HDG + m\angle GDE = m\angle HDE$ ?
5. If  $m\angle HDE = m\angle ICD$  and  $m\angle GDE = m\angle HCD$ , why does  $m\angle HDE - m\angle GDE = m\angle ICD - m\angle HCD$ ?
6. If  $\overline{FE} \perp \overline{AE}$ , how can we be sure that there is not some other line through  $F$  that is perpendicular to  $\overline{AE}$ ?
7. If  $3(AB + AC) = 72$ , what property allows us to write  $AB + BC = 24$ ?
8. Write the Linear-Pair Postulate using  $\angle HDC$ .
9. How do you know that  $\overline{HD} \cong \overline{HD}$ ?
10. If  $m\angle AIB + m\angle BIC + m\angle CIH = 115^\circ$  and  $m\angle DGE = m\angle BIC$ , how do we know that  $m\angle AIB + m\angle DGE + m\angle CIH = 115^\circ$ ?