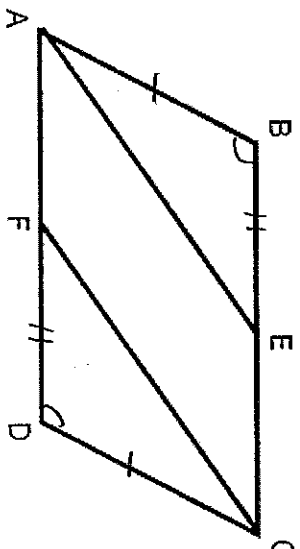


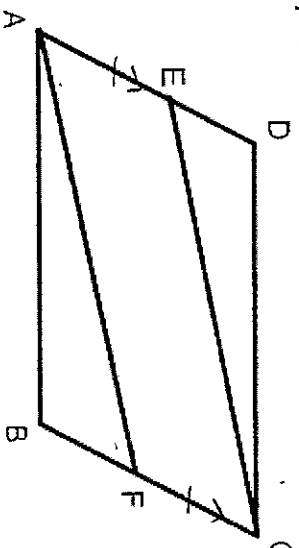
1. Given: ABCD is a parallelogram
E is the midpoint of \overline{BC}
F is the midpoint of \overline{AD}

Prove: $\overline{AE} \cong \overline{CF}$



1. ABCD is \square ; E is midpt. of \overline{BC} F is midpt. of \overline{AD}	1. Given
2. $\angle B \cong \angle D$	2. $\square \rightarrow$ opp. \angle 's \cong
3. $\overline{AB} \cong \overline{CD}$; $\overline{BC} \cong \overline{AD}$	3. $\square \rightarrow$ opp. sides \cong
4. $BC = AD$	4. def. \cong
5. $\frac{1}{2}BC = \frac{1}{2}AD$	5. mult. prop. =
6. $BE = \frac{1}{2}BC$; $FD = \frac{1}{2}AD$	6. midpt. Thm.
7. $BE = FD$	7. subst.
8. $\overline{BE} \cong \overline{FD}$	8. def. \cong
9. $\triangle BEA \cong \triangle DFC$	9. SAS
10. $\overline{AE} \cong \overline{CF}$	10. CPCTC

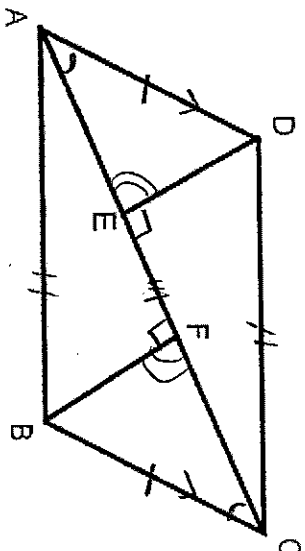
2. Given: ABCD is a parallelogram, $\overline{AE} \cong \overline{CF}$
Prove: $\overline{EC} \cong \overline{FA}$



1. ABCD is \square ; $\overline{AE} \cong \overline{CF}$	1. Given
2. $\overline{AB} \parallel \overline{CD}$	2. def. \square
3. \overline{AECE} is \square	3. 1 pair opp. sides \cong + $\parallel \rightarrow \square$
4. $\overline{EC} \cong \overline{FA}$	4. opp. sides $\square \cong$

3. Given: ABCD is a parallelogram,
 $\overline{DE} \perp \overline{AC}$; $\overline{BF} \perp \overline{AC}$

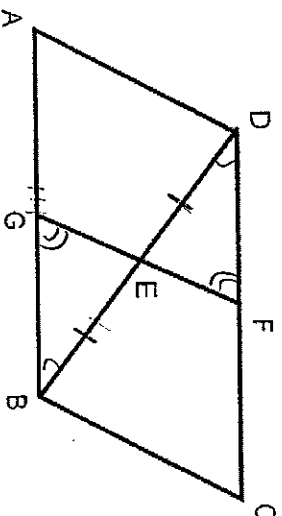
Prove: $\overline{AE} \cong \overline{CF}$



⑤	1. ABCD is \square ; $\overline{DE} \perp \overline{AC}$; $\overline{BF} \perp \overline{AC}$	1. Given
	2. $\overline{AD} \cong \overline{CB}$	2. opp. sides $\square \cong$
	3. $\overline{AD} \parallel \overline{CB}$	3. def. \square
④	4. $\angle DAC \cong \angle BCA$	4. \parallel lines \rightarrow alt. int. \angle 's \cong
	5. $\angle DEA + \angle BEC$ rt. \angle 's	5. def. \perp
	6. $m\angle DEA = 90^\circ$; $m\angle BEC = 90^\circ$	6. def. rt. \angle 's
	7. $m\angle DEA = m\angle BEC$	7. subst.
③	8. $\angle DEA \cong \angle BEC$	8. def. \cong
	9. $\triangle AED \cong \triangle CEB$	9. AAS
	10. $\overline{AE} \cong \overline{CE}$	10. CPCTC

4. Given: ABCD is a parallelogram
 \overline{FG} bisects \overline{DB}

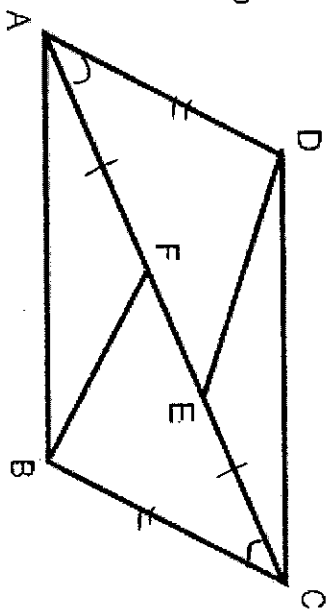
Prove: \overline{DB} bisects \overline{FG}



③	1. ABCD is \square ; \overline{FG} bisects \overline{DB}	1. Given
④	2. $\overline{DC} \parallel \overline{AB}$; $\overline{DA} \parallel \overline{CB}$	2. def. \square
	3. $\angle DFG \cong \angle BGF$; $\angle CDG \cong \angle ABG$	3. \parallel lines \rightarrow alt. int. \angle 's \cong
	4. E is mdpt. of \overline{DB}	4. def. bisect
	5. $\overline{DE} \cong \overline{EB}$	5. def. mdpt.
	6. $\triangle DFE \cong \triangle BGE$	6. AAS
	7. $\overline{FE} \cong \overline{GE}$	7. CPCTC
	8. E is mdpt. of \overline{FG}	8. def. mdpt.
	9. \overline{DB} bisects \overline{FG}	9. def. bisect

5. Given: \overline{AC} is a diagonal in parallelogram ABCD
 $\overline{EC} \cong \overline{FA}$

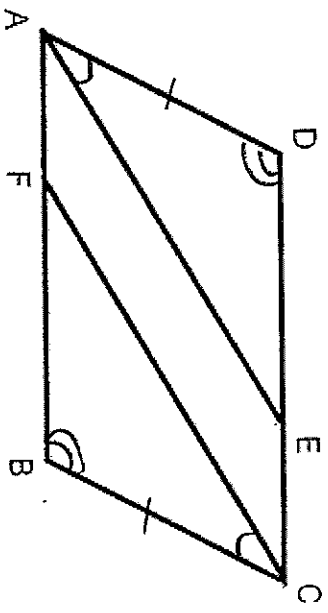
Prove: $\overline{DE} \parallel \overline{BF}$



③	1. \overline{AC} is diag. in \square ABCD; $\overline{EC} \cong \overline{FA}$	1. Given.
	2. $\overline{DA} \cong \overline{BC}$	2. Opp. sides $\square \cong$
	3. $FA + FE = AE$; $EC + FE = CF$	3. Seg. Add'n Post.
	4. $\overline{AE} = \overline{CF}$	4. def. \cong
	5. $\overline{EC} + \overline{FE} = \overline{FA} + \overline{FE}$	5b. Reflexive 5. Add'n Prop. =
	6. $CF = AE$	6. Subst.
⑤	7. $\overline{CF} \cong \overline{AE}$	7. def. \cong
	8. $\overline{AD} \parallel \overline{CB}$	8. def. \square
④	9. $\angle DAC \cong \angle BCF$	9. \parallel lines \rightarrow alt. int. \angle 's \cong
	10. $\triangle ADE \cong \triangle CBF$	10. SAS
	11. $\angle DEA \cong \angle BFC$	11. CPCTC
	12. $\overline{DE} \parallel \overline{BF}$	12. Alt. int. \angle 's $\cong \rightarrow \parallel$ lines

6. Given: ABCD is a parallelogram
 \overline{AE} bisects $\angle DAB$; \overline{CF} bisects $\angle DCB$

Prove: $\overline{AE} \cong \overline{CF}$



1. ABCD is \square ; \overline{AE} bisects $\angle DAB$ \overline{CF} bisects $\angle DCB$	1. Given
2. $m\angle DAE = \frac{1}{2}m\angle DAB$ $m\angle BCF = \frac{1}{2}m\angle BCD$	2. \angle bis. thm.
3. $\angle DAB \cong \angle BCD$; $\angle D \cong \angle B$	3. $\square \rightarrow$ opp. $\angle s \cong$
4. $m\angle DAB = m\angle BCD$	4. def. \cong
5. $\frac{1}{2}m\angle DAB = \frac{1}{2}m\angle BCD$	5. mult. prop. =
6. $m\angle DAE = m\angle BCF$	6. subst.
7. $\angle DAE \cong \angle BCF$	7. def. \cong
8. $\overline{DA} \cong \overline{CB}$	8. \square opp sides \cong
9. $\triangle ADE \cong \triangle CBF$	9. ASA
10. $\overline{AE} \cong \overline{CF}$	10. CPCTC