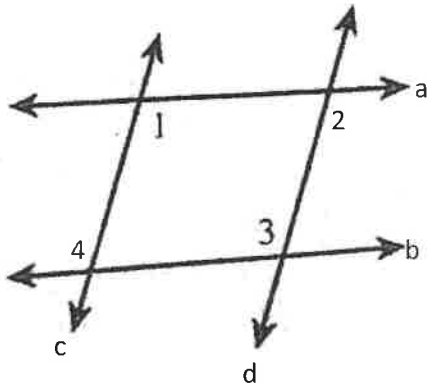
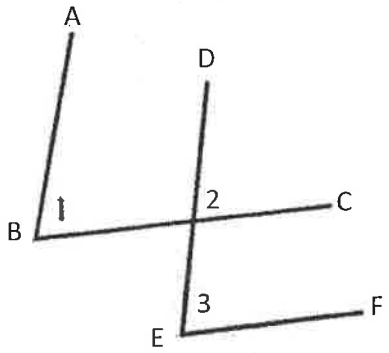
Section 4.2 – Practice Problems

1. Given: $c||d$ and $\angle 1 = \angle 3$
   Prove: $a||b$



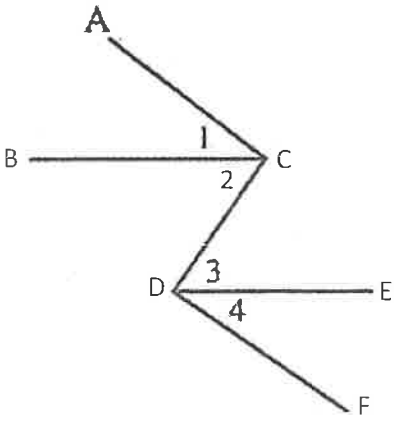
Proof	Statement	Reason
1.	$c \parallel d$	Given
2.	$\angle 1 = \angle 3$	Given
3.	$\angle 3 = \angle 4$	Corresponding
4.	$\angle 1 = \angle 4$	Alt interior
5.	$a \parallel b$	Alternate Interior ∠'s

2. Given: $\angle 1 = \angle 2$ and $\angle 1 = \angle 3$
   Prove: $BC||EF$



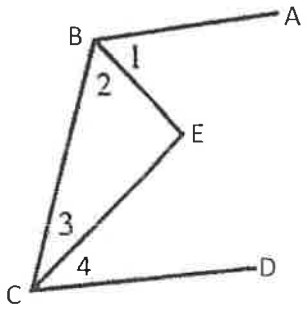
Proof	Statement	Reason
1.	$\angle 1 = \angle 2$	Given
2.	$\angle 1 = \angle 3$	Given
3.	$\angle 2 = \angle 3$	Both = to ∠1
4.	BC ll EF	corresponding ∠s

3. Given: $\angle ACD = \angle CDF$ and $\angle 1 = \angle 4$
   Prove: $BC||DE$



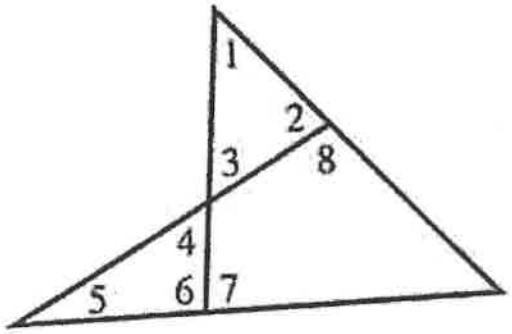
Proof	Statement	Reason
1.	$\angle ACD = \angle CDF$	Given
2.	$\angle 1 + \angle 2 = \angle 3 + \angle 4$	Addition of Angles
3.	$\angle 1 = \angle 4$	Given
4.	$\angle 1 + \angle 2 = \angle 3 + \angle 1$	Substitution ∠3 → ∠4
5.	$\angle 2 = \angle 3$	Subtraction of ∠1
6.	$BC \parallel DE$	Alt. Interior angles

4. Given: BE *bisects* $\angle ABC$ and CE *bisects* $\angle BCD$
   $\angle 2 + \angle 3 = 90°$
   Prove: $AB||CD$



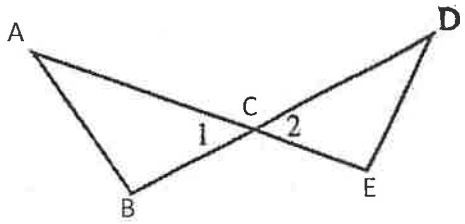
Proof	Statement	Reason
1.	BE bisects $\angle ABC$	Given
2.	$\angle 1 = \angle 2$	Definition of Bisect
3.	CE bisects $\angle BCD$	Given
4.	$\angle 3 = \angle 4$	Bisector Definition
5.	$\angle 2 + \angle 3 = 90°$	Given
6.	$\angle 2 + \angle 2 + \angle 3 + \angle 3 =$	Substitution
7.	$\angle 1 + \angle 2 + \angle 3 + \angle 4 =$	Addition
8.	$AB \parallel CD$	co-interior ∠'s

5. Given: $\angle 1 = \angle 5$
Prove: $\angle 7 = \angle 8$



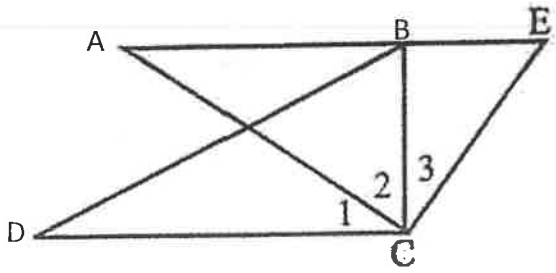
Proof	Statement	Reason
1.	$\angle 1 = \angle 5$	
2.	$\angle 3 = \angle 4$	Vertical Angles
3.	$\angle 2 = \angle 6$	Third Angle of a Triangle
4.	$\angle 6 + \angle 7 = \angle 2 + \angle 8$	Supplementary Angles
5.	$\angle 7 = \angle 8$	Equal Angles from Supplementary

6. Given: $AB \perp BD$ and $DE \perp AE$
Prove: $\angle A = \angle D$



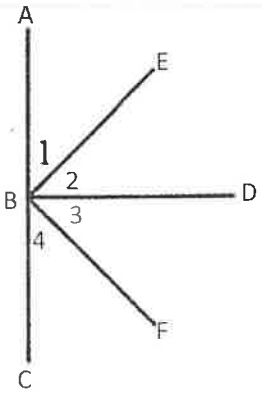
Proof	Statement	Reason
1.	$AB \perp BD$	Given
2.	$DE \perp AE$	Given
3.	$\angle B = \angle E$	90° since perpendicular
4.	$\angle 1 = \angle 2$	Vertical angles
5.	$\angle A = \angle D$	3rd ∠ of △

7. Given: $BC \perp CD$ and $AC \perp CE$
Prove: $\angle 1 = \angle 3$



Statement	Reason
$BC \perp CD$	Given
$AC \perp CE$	Given
$\angle BCD = 90°$	Def^{N} of perp
$\angle 1 + \angle 2 = 90°$	$\angle BCD = \angle 1 + \angle 2$
$\angle ACE = 90°$	Def^{N} of perp
$\angle 3 + \angle 2 = 90°$	$\angle ACE = \angle 3 + \angle 2$
$\angle 1 = \angle 3$	Subtraction

8. Given: $AC \perp BD$ and BD *bisects* $\angle EBF$
Prove: $\angle 1 = \angle 4$



Statement	Reason
$AC \perp BD$	Given
$\angle 1 + \angle 2 = \angle 3 + \angle 4$	$\perp$ ∠'s are equal
BD bisects $\angle EBF$	Given
$\angle 2 = \angle 3$	Def^{N} of Bisect
$\angle 1 = \angle 4$	Subtraction