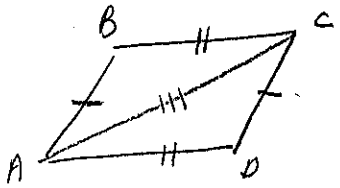
Geometry Honors
Proof Template

5.2

Name_____

Page/Problem 175/11 Thm. 5.4

Diagram:



Given: Quad. ABCD
$\overline{AB} \cong \overline{CD}$
$\overline{BC} \cong \overline{AD}$

Prove: ABCD is ▱

Statement	Reason
1. Quad. ABCD; $\overline{AB} \cong \overline{CD}$; $\overline{BC} \cong \overline{AD}$	1. Given
2. Draw AC	2. Through 2 pts → 1 line
3. $\overline{AC} \cong \overline{AC}$	3. Reflexive
4. $\triangle ACB \cong \triangle CAD$	4. SSS
5. $\angle BCA \cong \angle DAC$; $\angle BAC \cong \angle DCA$	5. CPCTC
6. $\overline{AB} \parallel \overline{CD}$; $\overline{BC} \parallel \overline{AD}$	6. corr. $\angle$s $\cong$ → $\parallel$ lines
7. ABCD is ▱	7. def. ▱

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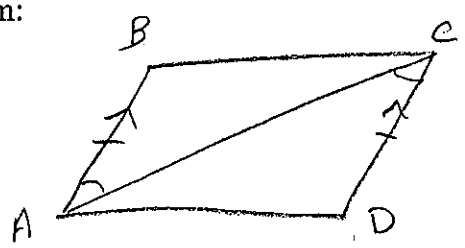
Page/Problem 175 / 12 Thm. 5.5

Diagram:



Given: Quad. ABCD
$\overline{AB} \parallel \overline{CD}$
$\overline{AB} \cong \overline{CD}$

Prove: ABCD is ▱

Statement	Reason
1. Quad. ABCD; $\overline{AB} \parallel \overline{CD}$; $\overline{AB} \cong \overline{CD}$	1. Given
2. Draw $\overline{AC}$	2. 2 pts. → 1 line
3. $\angle BAC \cong \angle DCA$	3. $\parallel$ lines → corr. $\angle$s $\cong$
4. $\overline{AC} \cong \overline{AC}$	4. Reflexive
5. $\triangle BCA \cong \triangle DAC$	5. SAS
6. $\angle CAD \cong \angle BCA$	6. CPCTC
7. $\overline{BC} \parallel \overline{AD}$	7. corr. $\angle$s $\cong$ → $\parallel$ lines
8. ABCD is ▱	8. def. ▱

Geometry Honors
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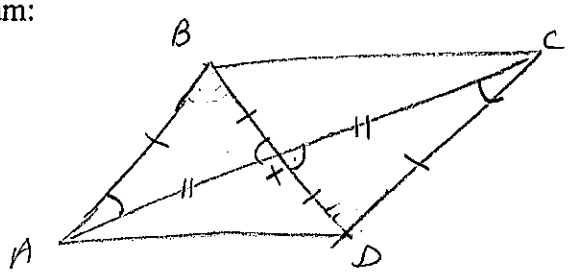
Page/Problem 175/13 Thm. 5-7 Diagram:



Given: Quad. ABCD
$\overline{AC}$ & $\overline{BD}$ bisect each other

Prove: ABCD is ▱

Statement	Reason
1. Quad. ABCD; $\overline{AC}$ & $\overline{BD}$ bisect each other	1. Given
2. X is mdpt. of $\overline{AC}$ & $\overline{BD}$	2. def. seg. bisector
3. $\overline{AX} \cong \overline{XC}$; $\overline{BX} \cong \overline{XD}$	3. def. mdpt.
4. $\angle BXA \cong \angle CXD$	4. Vert. $\angle$s $\cong$
5. $\triangle AXB \cong \triangle CXD$	5. SAS
6. $\angle BAX \cong \angle DCX$; $\overline{BA} \cong \overline{DC}$	6. CPCTC
7. $\overline{BA} \parallel \overline{DC}$	7. Alt. int. $\angle$s $\cong$ → $\parallel$ lines
8. ABCD is ▱	8. 1 pair opp. sides $\cong$ + $\parallel$ → ▱

Geometry Honors
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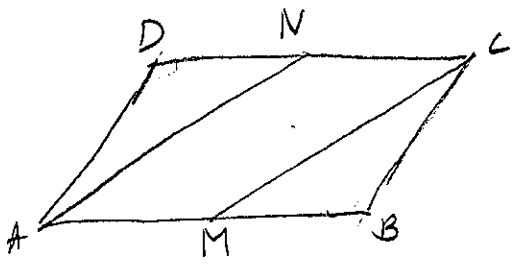
Name_____

Page/Problem 175/14

Diagram:



Given: $\square ABCD$
M + N are mdpts. of $\overline{AB}$ + $\overline{CD}$

Prove: AMCN is $\square$

Statement	Reason
1. $\square ABCD$; M+N mdpts. of $\overline{AB}$ + $\overline{CD}$	1. Given
2. $NC = \frac{1}{2} DC$; $AM = \frac{1}{2} AB$	2. Mdpt. Thm.
3. $\overline{DC} \cong \overline{AB}$	3. Opp. sides $\square$ $\cong$
4. $DC = AB$	4. def. $\cong$
5. $\frac{1}{2} DC = \frac{1}{2} AB$	5. Mult. prop. =
6. $NC = AM$	6. Substi.
7. $\overline{NC} \cong \overline{AM}$	7. def. $\cong$
8. $\overline{NC} \parallel \overline{AM}$	8. def. $\square$ * used from $\square ABCD$ which is ok since $\overline{NC}$ is part of $\overline{CD}$*
9. AMCN is $\square$	9. 1 pair sides $\cong$ + $\parallel$ → $\square$

5.2

(19) $42 + 8x - 6 = 180$

$8x = 144$

$x = 18$

$42 = 3y$

$14 = y$

(20) $3x - 40 = x$

$-40 = -2x$

$20 = x$

$y^2 = y + 30$

$y^2 - y - 30 = 0$

$(y - 6)(y + 5) = 0$

$y = 6 \quad y = -5$

(21) $26 = 3x - 2y$

$42 = 4x + y$

$\rightarrow$

$26 = 3x - 2y$

$84 = 8x + 2y$

$110 = 11x$

$10 = x$

$26 = 3(10) - 2y$

$-4 = -2y$

$2 = y$

(22) $3x = 7y - 2$

$4x + 1 = 9y$

$\rightarrow$

$3x + 2 = 7y$

$4x + 1 = 9y$

$\rightarrow$

$12x + 8 = 28y$

$-12x - 3 = -27y$

$5 = y$

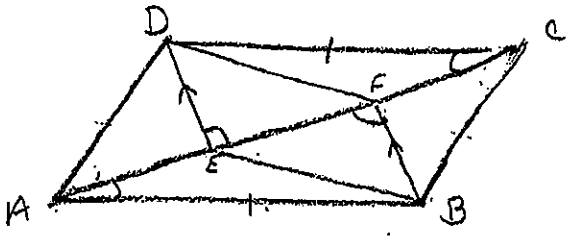
$3x = 7(5) - 2$

$3x = 33$

$x = 11$

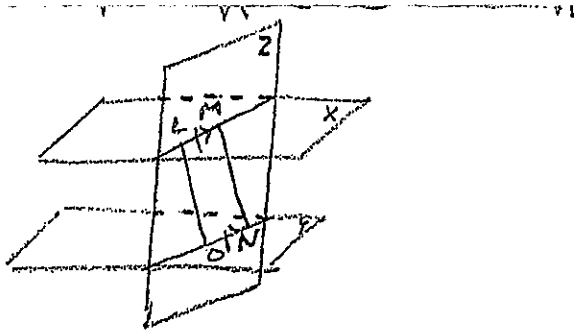
(5.2)

(23) Given: ▱ ABCD
$\overline{DE} \perp \overline{AC}$; $\overline{BF} \perp \overline{AC}$
Prove: DEBF is ▱



	1. ▱ ABCD $\overline{DE} \perp \overline{AC}$; $\overline{BF} \perp \overline{AC}$	1. Given
	2. $\overline{DE} \parallel \overline{FB}$	2. 2 lines ⊥ to same line ∥
(A)	3. $\angle DEC \cong \angle BFA$	3. ∥ lines → alt. int. $\angle$s ≅
	4. $\overline{DC} \parallel \overline{AB}$	4. def. ▱
(A)	5. $\angle BAC \cong \angle DCA$	5. ∥ lines → alt. int. $\angle$s ≅
(S)	6. $\overline{DC} \cong \overline{AB}$	6. ▱ → opp. sides ≅
	7. $\triangle DEC \cong \triangle BFA$	7. AAS
	8. $\overline{DE} \cong \overline{BF}$	8. CPCTC
	9. DEBF is ▱	9. quad. has opp. sides ∥ + ≅ → ▱

(24) Given: Plane X ∥ Plane Y
$\overline{LM} \cong \overline{ON}$
Prove: LMNO ▱



1. Plane X ∥ Plane Y	1. Given
2. $\overline{LM} \parallel \overline{ON}$	2. ∥ Planes cut by 3rd plane → lines of intersection ∥
3. $\overline{LM} \cong \overline{ON}$	3. Given
4. LMNO is ▱	4. If 1 pair opp. sides is $\cong$ & ∥ → ▱