

I'm getting it: You Are! You are a little smarter each day

Fill in the missing parts for all proofs.

- ① Given: M is the midpoint of \overline{AB} .
 B is the midpoint of \overline{MD} .

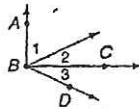


Prove: $MD = 2MB$

Proof:

Statements	Reasons
a. M is the midpoint of \overline{AB} . B is the midpoint of \overline{MD} .	a. Given
b. $AM = MB$ $MB = BD$	b. Def. midpt.
c. $MD = MB + BD$	c. Segment Addition
d. $MD = MB + MB$	d. Substitute (c, d)
e. $MD = 2MB$	e. simplify

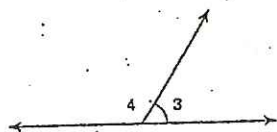
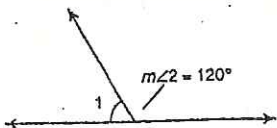
- ② Given: $\overline{AB} \perp \overline{BC}$
 $m\angle 2 = m\angle 3$
 Prove: $m\angle 1 + m\angle 3 = 90$



Proof:

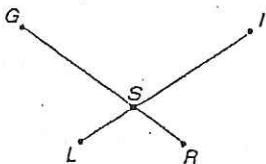
Statements	Reasons
a. $\overline{AB} \perp \overline{BC}$ $m\angle 2 = m\angle 3$	a. Given
b. $\angle ABC$ is a right angle.	b. Def. perpendicular
c. $m\angle ABC = 90$	c. Def. right
d. $m\angle ABC = m\angle 1 + m\angle 2$	d. Angle Addition
e. $m\angle 1 + m\angle 2 = 90$	e. Sub (c, d) or Transitive
f. $m\angle 1 + m\angle 3 = 90$	f. Sub (a, e)

- ③ Given: $\angle 1$ and $\angle 2$ are a linear pair
 $\angle 3$ and $\angle 4$ are a linear pair
 $m\angle 3 = m\angle 1$
 $m\angle 2 = 120^\circ$
 Prove: $m\angle 4 = 120^\circ$



Statement	Reason
1. $\angle 1$ and $\angle 2$ are a linear pair	1. Given
2. $m\angle 1 + m\angle 2 = 180^\circ$	2. Def. Lin. Pair
3. $m\angle 2 = 120^\circ$	3. Given
4. $m\angle 1 + 120^\circ = 180^\circ$	4. Sub (2, 3)
5. $m\angle 1 = 60^\circ$	5. Subtract
6. $m\angle 1 = m\angle 3$	6. Given
7. $m\angle 3 = 60^\circ$	7. Sub (5, 6) or Transitive
8. $\angle 3$ and $\angle 4$ are a linear pair	8. Given
9. $m\angle 3 + m\angle 4 = 180^\circ$	9. Def. Lin. Pair
10. $60^\circ + m\angle 4 = 180^\circ$	10. Sub (7, 9)
11. $m\angle 4 = 120^\circ$	11. Subtract

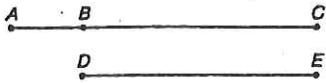
- ④ Given: $\overline{GR} \cong \overline{IL}$
 $\overline{SR} \cong \overline{SL}$
 Prove: $\overline{GS} \cong \overline{IS}$



Statements	Reasons
1. $GR = IL$	1. Given
2. $SR = SL$	2. Given
3. $GS + SR = GR$	3. Segment +
4. $IS + SL = IL$	4. Segment Addition
5. $GS + SR = IS + SL$	5. Substitution (1 & 3) & 4)
6. $GS + SL = IS + SL$	6. $SR = SL$
7. $GS = IS$	7. Subtract

Try writing your own Two column proof! The number of steps you will probably use is listed.

- 5) Given: $BC = DE$
 Prove: $AC = AB + DE$



Statements	Reasons
1. $BC = DE$	1. Given
2. $AB + BC = AC$	2. Segment Addition
3. $AB + DE = AC$	3. Substitute (1, 2)

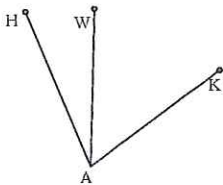
- 6)

 Given: $m\angle 1 = m\angle 3$ *could be reversed*
 Prove: $m\angle 2 = m\angle 4$

Statements	Reasons
a. $\angle 1 = \angle 3$	a. Given
b. $\angle 1 + \angle 2 = 180$	b. Linear Pairs
c. $\angle 3 + \angle 4 = 180$	c. Linear Pairs
d. $\angle 1 + \angle 2 = \angle 3 + \angle 4$	d. Substitution (or Transitive)
e. $\angle 1 + \angle 2 = \angle 1 + \angle 4$	e. Sub (a, d)
f. $\angle 2 = \angle 4$	f. - Subtract

- 7) Given: $m\angle HAW = 5x + 7$
 $m\angle WAK = x - 3$
 $m\angle HAK = 100^\circ$

Prove: $x = 16$



Statements	Reasons
1. $\angle HAW = 5x + 7$	} given
2. $\angle WAK = x - 3$	
3. $\angle HAK = 100^\circ$	
4. $\angle HAW + \angle WAK = \angle HAK$	4. Angle Addition (necessary)
5. $5x + 7 + x - 3 = 100$	5. Substitute (1, 2, 3, 4)
6. $6x + 4 = 100$	6. Simplify
7. $6x = 96$	7. Subtract
8. $x = 16$	8. Divide

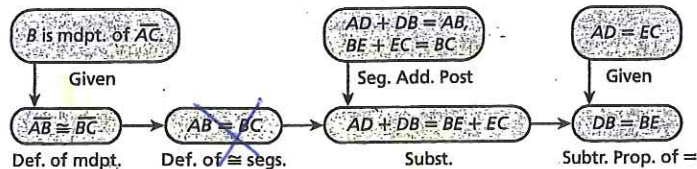
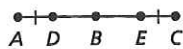
- 8) Use the given flowchart proof to write a two-column proof.

Given: B is the midpoint of \overline{AC} .

$AD = EC$

Prove: $DB = BE$

Flowchart proof:



8. $DB = BE$

8. subtract

Statement	Reason
1. B midpt	1. Given
2. $AB = BC$	2. given
3. $AD + DB = AB$	3. Seg. +
4. $BE + EC = BC$	4. Seg. +
5. $AD + DB = BE + EC$	5. Sub (2, 3, 4)
6. $AD = EC$	6. given
7. $AD + DB = BE + AD$	7. Sub (5, 6)