

10/2/19 - Warm Up Problem

GIVEN: $m = n$, $n + p = 2r$, $r = m$

PROVE: $p = r$

Statements	Justifications
1. $m = n$	Given
2. $n + p = 2r$	Given
3. $r = m$	Given
4. $r = n$	substitution
5. $r + p = 2r$	Substitution
6. $p = r$	subtr.

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Concept 6 - Proofs using Postulates and Definitions

Goals: Complete proofs about geometric figures using postulates and definitions with the properties of equality and congruence

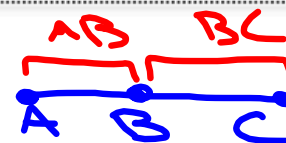
In order to write proofs about geometric figures, we are going to need to incorporate some definitions and postulates from previous concepts to use as justifications.

Using Postulates in Proofs

Postulates (accepted statements of fact)

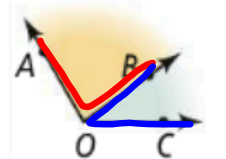
Segment Addition Postulate

If three points A, B, and C are collinear and B is between A and C, then $AB + BC = AC$.



Angle Addition Postulate

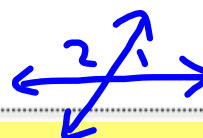
If point B is in the interior of $\angle AOC$, then $m\angle AOB + m\angle BOC = m\angle AOC$.



Linear Pair Postulate

If two angles for a linear pair, then they are supplementary.

(180)



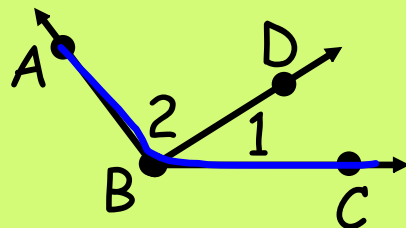
- postulates are used to introduce new equations into your proof that you can combined with the given information.

Using Postulates in a Proof

Given: $m\angle ABC = 130^\circ$

$m\angle 1 = 35^\circ$

Prove: $m\angle 2 = 95^\circ$

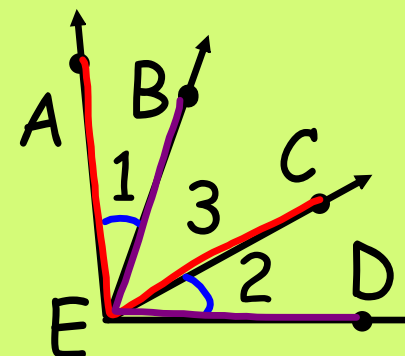


Statements	Justifications
1. $m\angle ABC = 130^\circ$	given
2. $m\angle 1 = 35^\circ$	given
3. $m\angle 1 + m\angle 2 = m\angle ABC$	Angle Add. Post.
4. $m\angle 1 + m\angle 2 = 130^\circ$	Substitution Prop.
5. $35^\circ + m\angle 2 = 130^\circ$	Substitution Prop.
6. $m\angle 2 = 95^\circ$	Subtraction Prop.

Using Postulates in a Proof

Given: $m\angle 1 = m\angle 2$

Prove: $m\angle AEC = m\angle BED$



Statements	Justifications
1. $m\angle 1 = m\angle 2$	given
2. $m\angle 1 + m\angle 3 = m\angle AEC$	Angle Add. Post.
3. $m\angle 2 + m\angle 3 = m\angle BED$	Angle Add. Post.
4. $m\angle 2 + m\angle 3 = m\angle AEC$	Substitution Prop.
5. $m\angle AEC = m\angle BED$	Transitive Prop. of =

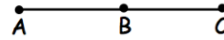
Assignment:

Concept 6 Worksheet #2 - due Wed. 10/9

work on (5-6) today

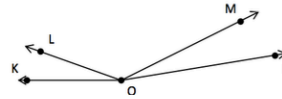
PROOFS USING POSTULATES

5. **Given:** $2AB = AC$
Prove: $AB = BC$



Statements	Justifications
1. $2AB = AC$	
2. $AB + BC = AC$	
3. $AB + BC = 2AB$	
4. $BC = AB$	
5. $AB = BC$	

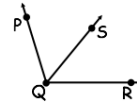
6. **Given:** $m\angle KOL = m\angle MON$
Prove: $m\angle KOM = m\angle LON$



Statements	Justifications
1. $m\angle KOL = m\angle MON$	
2. $m\angle KOL + m\angle LOM = m\angle KOM$	
3. $m\angle LOM + m\angle MON = m\angle LON$	
4. $m\angle KOL + m\angle MON = m\angle LON$	
5. $m\angle KOM = m\angle LON$	

PROOFS USING POSTULATES AND DEFINITIONS

7. **Given:** \overline{QS} is an angle bisector of $\angle PQR$.
Prove: $m\angle PQS = \frac{1}{2}m\angle PQR$



Statements	Justifications
1. \overline{QS} is an angle bisector of $\angle PQR$.	
2. $m\angle PQS = m\angle SQR$	
3. $m\angle PQS + m\angle SQR = m\angle PQR$	
4. $m\angle PQS + m\angle PQS = m\angle PQR$	
5. $2 \cdot m\angle PQS = m\angle PQR$	
6. $m\angle PQS = \frac{1}{2}m\angle PQR$	