NAME
Adv Geo -

2.3: Drawing Conclusions

Ms. Kresovic
R 19 Sep 2013

Objective

After studying this section, you will be able to

- Follow a five-step procedure to draw logical conclusions

Part One: Introduction

There wouldn't be much progress in this world if all we did was justify conclusions that someone else had already drawn. Neither will you make much progress as a student of geometry if all you can do is justify conclusions the textbook has already stated. Although the following procedure may not work every time, it will be helpful to you in drawing conclusions.

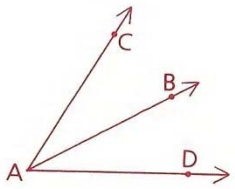
Procedure for Drawing Conclusions

1. Memorize theorems, definitions, and postulates.
2. Look for key words and symbols in the given information.
3. Think of all the theorems, definitions, and postulates that involve those keys.
4. Decide which theorem, definition, or postulate allows you to draw a conclusion.
5. Draw a conclusion, and give a reason to justify the conclusion. Be certain that you have not used the *reverse* of the correct reason.

→ ASN
ABOVE ⇒ CURRENT
ASN
ASN
CONVERSE

Example

Given: $\overrightarrow{AB}$ *bisects* $\angle CAD$.
Conclusion: ?

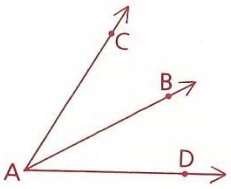


If ray bis ∠ then it ÷s it into 2 ≅ ∠s
CONC.

Thinking Process:

The key word is *bisects*.
The key symbols are → and ∠.
The definition of *bisector* (of an angle) contains those keys.
An appropriate conclusion is that $\angle CAB \cong \angle DAB$.

Example Given: $\overrightarrow{AB}$ bisects ∠CAD.
Conclusion: ?



Statements	Reasons
1 $\overrightarrow{AB}$ bisects ∠CAD.	1 Given
2 ∠CAB ≅ ∠DAB	2 Ray bis ∠ ⇒ 2 ≅ ∠s

Note The "If . . ." part of the reason matches the given information, and the "then . . ." part matches the conclusion being justified. *Be sure not to reverse that order.*

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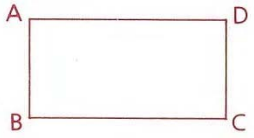
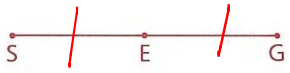
Problem 1 *Given:* $\angle A$ *is a right angle.*
$\angle B$ *is a right angle.*
Conclusion: ?



Proof

Statements	Reasons
1 $\angle A$ is a right angle.	1 Given
2 $\angle B$ is a right angle.	2 Given
3 $\angle A \cong \angle B$	3 If two $\angle$s are right $\angle$s, then they are $\cong$.

Problem 2 *Given:* E *is the midpoint of* $\overline{SG}$.
Conclusion: ?



Proof

Statements	Reasons
1 E is the midpoint of $\overline{SG}$.	1 Given
2 $\overline{SE} \cong \overline{EG}$	2 If a point is the midpoint of a segment, the point divides the segment into two $\cong$ segments.

Problem 3 *Given:* $\angle PRS$ *is a right angle.*
Conclusion: ?

Proof

Statements	Reasons
1 $\angle PRS$ is a right $\angle$.	1 Given
2 $\overrightarrow{PR} \perp \overrightarrow{RS}$	2 If two lines intersect to form a right $\angle$, they are $\perp$.

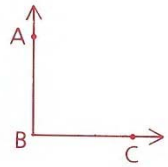
In sample problem 3, we could have drawn a different conclusion.
Do you know what that other conclusion is?

$\angle PRS = 90^\circ$ 2. rt $\angle \Rightarrow 90^\circ$

Homework Due F 20 Sep 2013

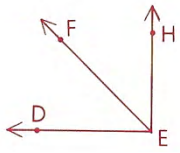
In problems 1 – 7, supply your own correct conclusion and reason. Write a two-column proof.

1 Given: $\overleftrightarrow{AB} \perp \overleftrightarrow{BC}$
Conclusion: ?



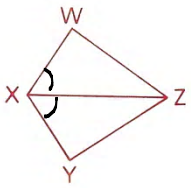
Statements	Reasons
1. $\overleftrightarrow{AB} \perp \overleftrightarrow{BC}$	1. Given
2. $\angle ABC$ rt $\angle$	2. $\perp \Rightarrow$ rt $\angle$

2 Given: $\angle DEF$ is comp. to $\angle HEF$.
Conclusion: ?



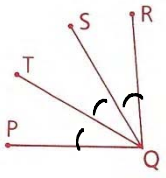
Statements	Reasons
1. $\angle DEF$ comp $\angle HEF$	1. Given
2. $\angle DEH$ rt $\angle$	2. comp $\angle$s $\Rightarrow$ rt $\angle$

3 Given: $\angle WXZ \cong \angle YXZ$
Conclusion: ?



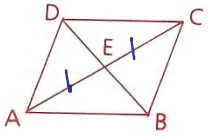
Statements	Reasons
1. $\angle WXZ \cong \angle YXZ$	1. Given
2. $\overline{XZ}$ bis $\angle WXY$	2. $\cong$ $\angle$s $\Rightarrow$ bis

4 Given: $\overrightarrow{QS}$ and $\overrightarrow{QT}$ trisect $\angle PQR$.
Conclusion: ?



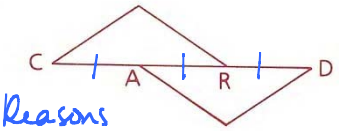
Statements	Reasons
1. $\overrightarrow{QS}$ & $\overrightarrow{QT}$ trs $\angle PQR$	1. Given
2. $\angle RQS \cong \angle SQT \cong \angle TQP$	2. trs $\Rightarrow$ 3 $\cong$ $\angle$s

5 Given: E is the midpoint of $\overline{AC}$.
Conclusion: ?



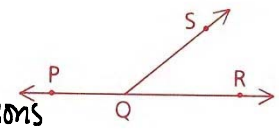
Statements	Reasons
1. E mdpt $\overline{AC}$	1. Given
2. $\overline{AE} \cong \overline{EC}$	2. mdpt $\Rightarrow$ 2 $\cong$ segs

6 Given: A and R trisect $\overline{CD}$.
Conclusion: ?



Statements	Reasons
1. A & R trs $\overline{CD}$	1. Given
2. $\overline{CA} \cong \overline{AR} \cong \overline{RD}$	2. trs $\Rightarrow$ 3 $\cong$ segs

7 Given: Diagram as shown
Conclusion: ?



Statements	Reasons
1. Diag	1. Given
2. $\angle PQR$ st $\angle$	2. Diag $\Rightarrow$ st $\angle$

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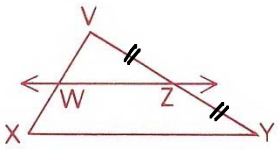
In problems 8, 10, & 11, draw two different conclusions. Write a two-column proof.

Example:

9 Given: $\overline{PA} \perp \overline{AR}$
Conclusions: ?

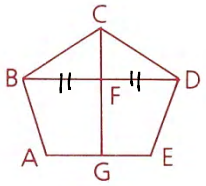
	Statements	Reasons
Conclusion 1 ①	1. $\overline{PA} \perp \overline{AR}$	1. Given
Conclusion 2 ②	2. ∠PAR is rt ∠	2. ⊥ ⇒ rt ∠
	3. ∠PAR is 90°	3. rt ∠ ⇒ 90°

8 Given: $\overleftrightarrow{WZ}$ bisects $\overline{VY}$.
Conclusions: ?



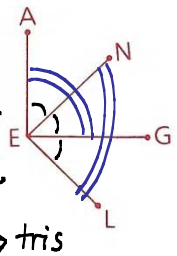
Statements	Reasons
1. $\overleftrightarrow{WZ}$ bis $\overline{VY}$	1. Given
2. $\overline{VZ} \cong \overline{ZY}$	2. bis ⇒ 2 ≅ segs
3. Z mdpt VY	3. 2 ≅ segs ⇒ mdpt

10 Given: $\overleftrightarrow{CG}$ bisects $\overline{BD}$.
Conclusions: ?



Statements	Reasons
1. $\overleftrightarrow{CG}$ bis $\overline{BD}$	1. Given
2. $\overline{BF} \cong \overline{FD}$	2. bis ⇒ 2 ≅ segs
3. F mdpt $\overline{BD}$	3. 2 ≅ segs ⇒ mdpt

11 Given: ∠AEN ≅ ∠GEN ≅ ∠GEL
Conclusions: ?



Statements	Reasons
1. ∠AEN ≅ ∠GEN ≅ ∠GEL	1. Given
2. ∠AEL tris by $\overline{EN}$ & $\overline{EG}$	2. 3 ≅ Δs ⇒ tris
3. ∠AEG ≅ ∠NEL	3. Add