Lesson 2-3

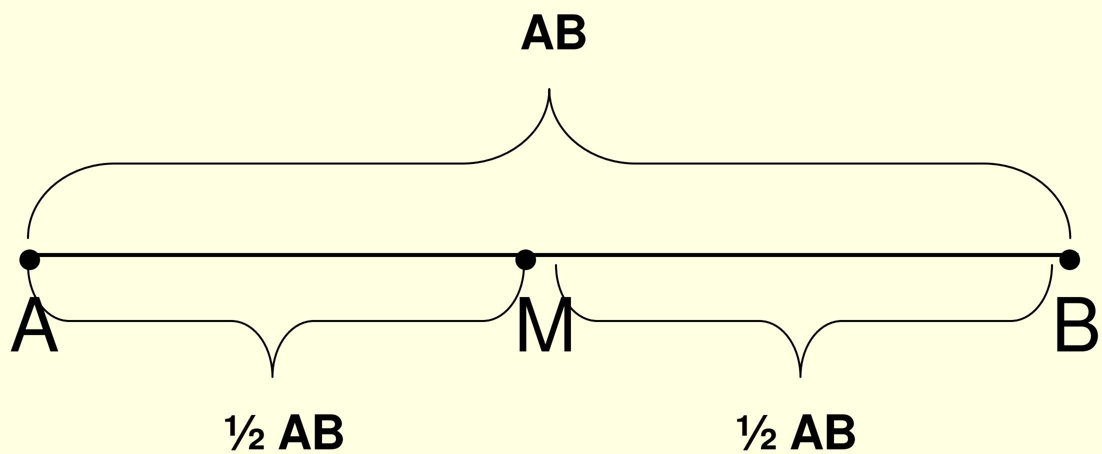
Proving Theorems

Reminders

- Postulates are statements that are accepted without proof
- Theorems are statements that are proven through the use of definitions and postulates

Midpoint Theorem

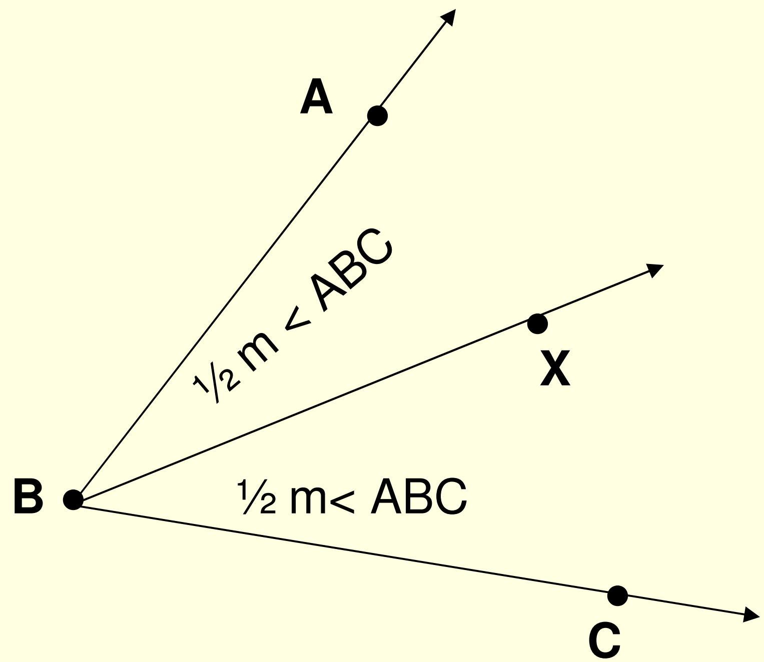
- If M is the midpoint of $\overline{AB}$, then AM = ½ AB and MB = ½ AB



Angle Bisector Theorem

- If $\overrightarrow{BX}$ is the bisector of <ABC, then

m< ABX = ½ m<ABC and m<XBC = ½ m< ABC



Deductive Reasoning

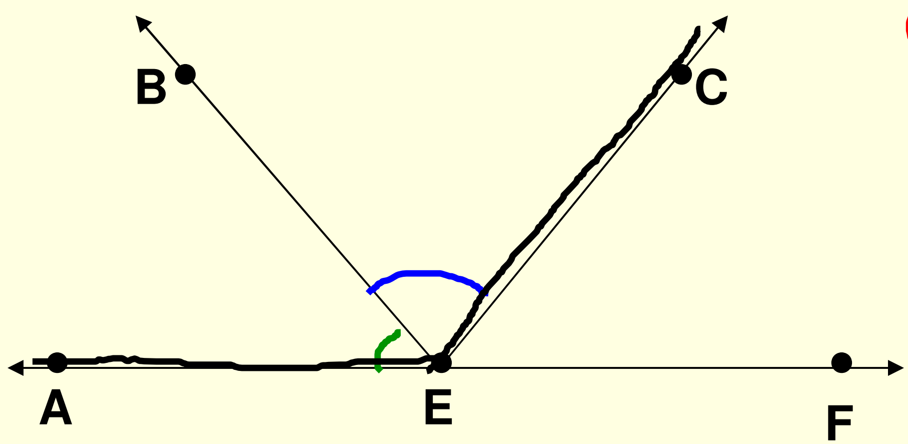
- Proving statements by reasoning from accepted postulates, definitions, theorems, and given information

Example 1

- Write the postulate, theorem, or definition that justifies the statement below

- m< AEB + m< BEC = m< AEC

angle addition
postulate

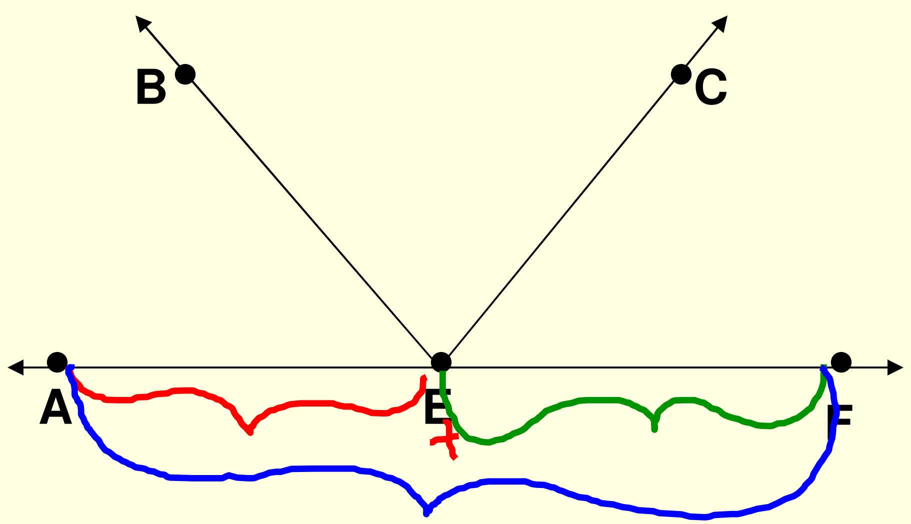


Example 2

- Write the postulate, theorem, or definition that justifies the statement below

- AE + EF = AF

Segment addition postulate

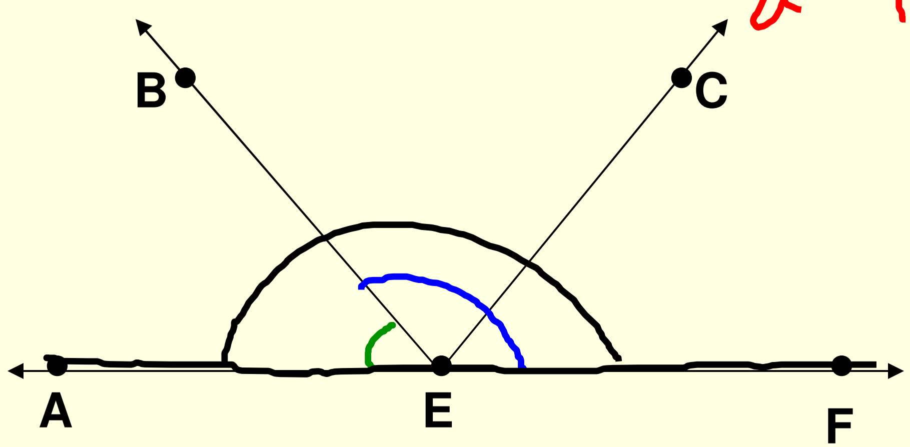


Example 3

- Write the postulate, theorem, or definition that justifies the statement below

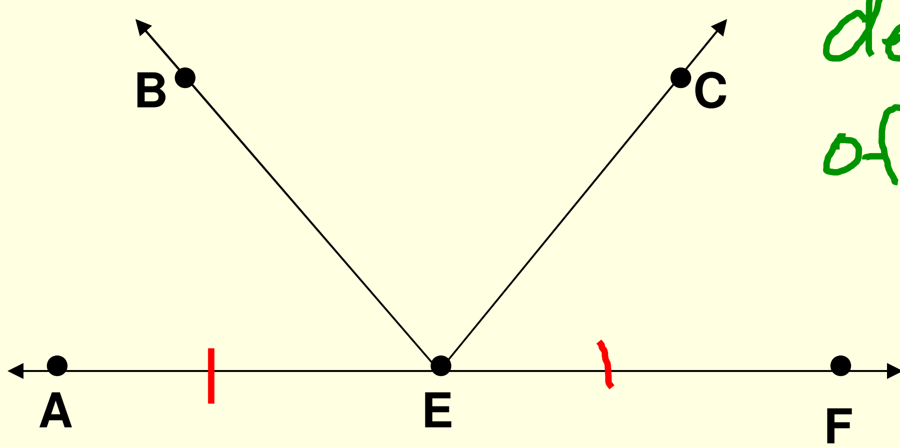
- m< AEB + m< BEF = 180°

definition of a linear pair



Example 4

- Write the postulate, theorem, or definition that justifies the statement below
- If E is the midpoint of $\overline{AF}$, then $\overline{AE} \cong \overline{EF}$

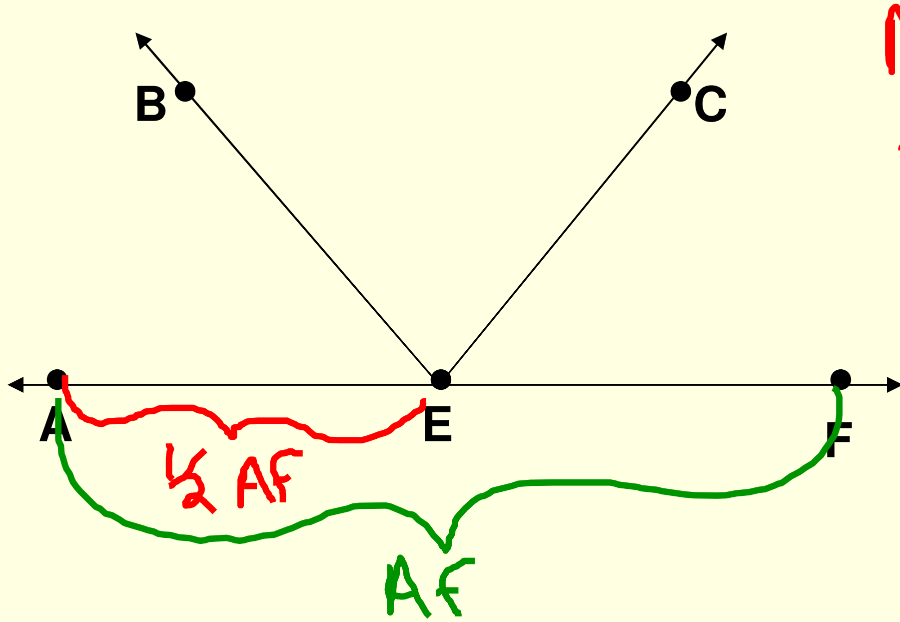


definition of a midpoint

Example 5

- Write the postulate, theorem, or definition that justifies the statement below

- If E is the midpoint of $\overline{AF}$, then AE = ½ AF

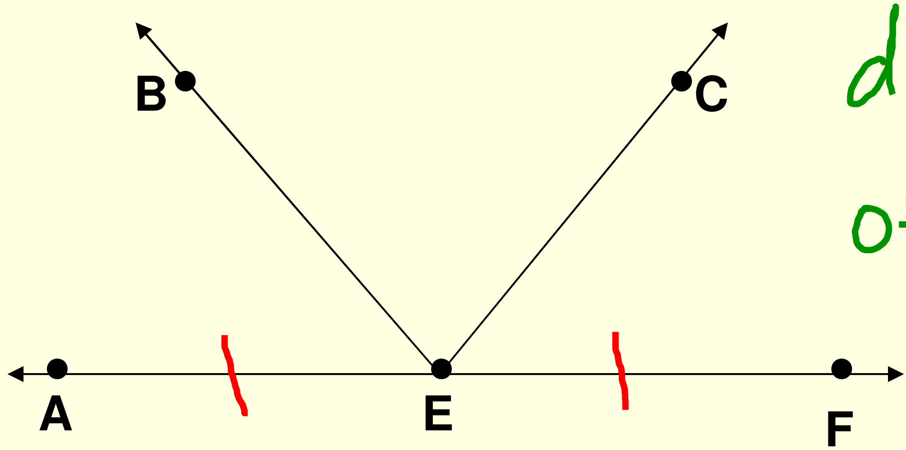


Midpoint Theorem

Example 6

- Write the postulate, theorem, or definition that justifies the statement below

- If E is the midpoint of $\overline{AF}$, then $\overrightarrow{EC}$ bisects $\overline{AF}$

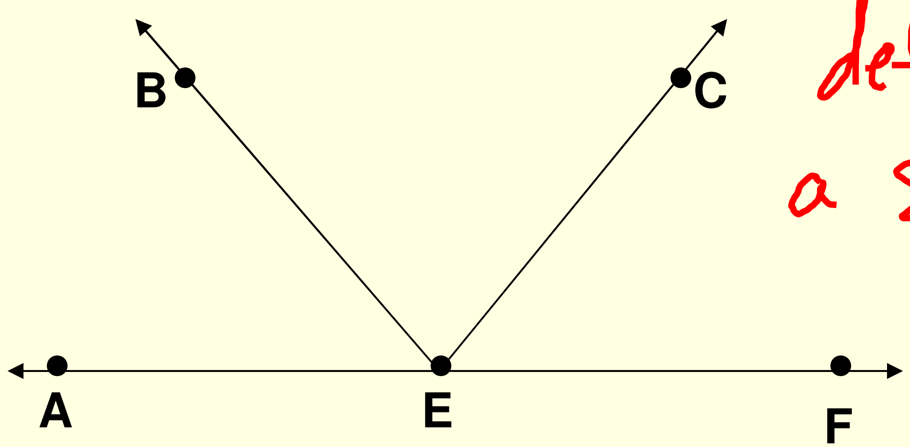


definition of a segment bisector

Example 7

- Write the postulate, theorem, or definition that justifies the statement below

- If ray EB bisects $\overline{AF}$, then E is the midpoint of $\overline{AF}$



definition of a segment bisector

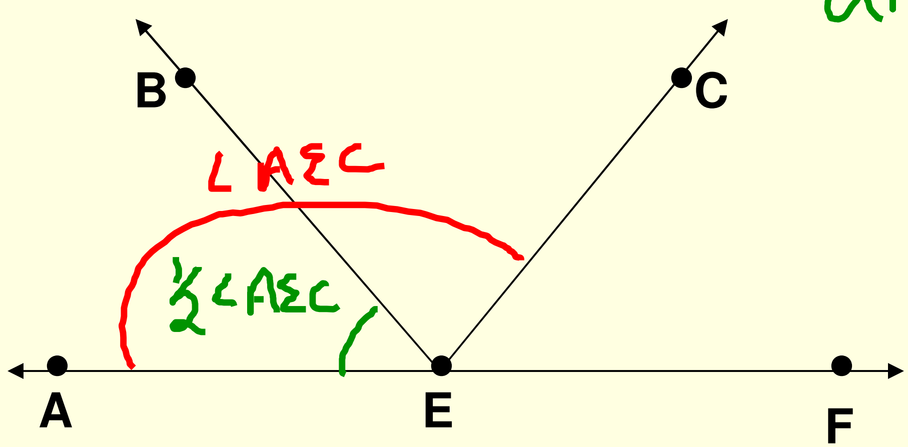
Example 8

- Write the postulate, theorem, or definition that justifies the statement belo

- If ray EB is the bisector of <AEC, then

  m< AEB = ½ m< AEC

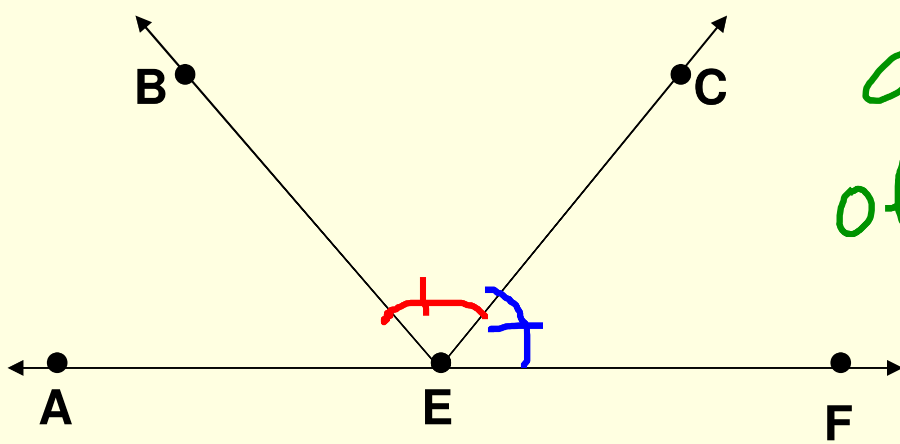
angle bisector theorem



Example 9

- Write the postulate, theorem, or definition that justifies the statement below

- If <BEC $\cong$ <CEF, then ray EC is the bisector of <BEF



definition of an angle bisector