MATH 3110

Monday Oct 5, 2015

Quiz 5 will be this Wednesday, Oct 7. It will cover ch 5.

Th. 30
If

Th. 31
If

then

then
Theorem 3.1 in Detail

**Proof**

1. Given angle \( \angle ABC \) and point \( D \) in interior.

2. \( D \) and \( C \) lie in same side of \( \overrightarrow{AB} \)
   (by definition of \( D \) being in angle interior)

3. Every point of ray \( \overrightarrow{BD} \) except \( B \) lies in that same half plane, on same side of \( \overrightarrow{AB} \) as \( C \).
   (by theorem 3.0 applied to ray \( \overrightarrow{BD} \) that has endpoint on line \( \overrightarrow{BA} \))
(4) Points D, A lie on same side of \( \overrightarrow{BC} \)
(by definition of what it means to say that D is in interior of angle \( \angle ABC \))

(5) All points of ray \( \overrightarrow{BD} \) except endpoint B lie on same side of line \( \overrightarrow{BC} \) as point A.
(by Thm. 3.B applied to ray \( \overrightarrow{BD} \) with endpoint on line \( \overrightarrow{BC} \))

(6) All points on ray \( \overrightarrow{BD} \) except endpoint B lie in interior of \( \angle ABC \)
(by statements (3), (5), all points on ray \( \overrightarrow{BD} \) except B lie in both of those half planes
so by definition of angle interior we can say that those points are in the interior
End of proof
Easy Construction

Th 32: about a segment with endpoint on a line.

If

then

Th 33

If

then

If
Proof

Th. 32 applied to segment $\overline{AB}$ with endpoint on line $\overline{BC}$

Definition of angle $\angle BAC$
Theorem 35: The Crossbar Theorem
If D is in interior of \( \angle ABC \), then \( \overrightarrow{BD} \) intersects segment \( \overline{AC} \) at a point between \( A \) and \( C \).

If

then

End of lecture