Chapter 8

PARALLEL TRANSPORT

Parallel straight lines are straight lines lying in a plane which do not meet if continued indefinitely in both directions. — Euclid, Elements, Definition 23

In this chapter we will further develop the notion of *parallel transport* that was introduced in Chapter 7. This chapter may be studied independently of Chapter 7 if you read the section in Chapter 7 entitled Introducing Parallel Transport. The basic idea of Chapter 8 is to collect all the results related to parallelism that can be examined without assuming any special properties on the plane about parallel lines or about the sum of the angles on the plane. These properties (postulates) will be discussed in detail in Chapter 10.
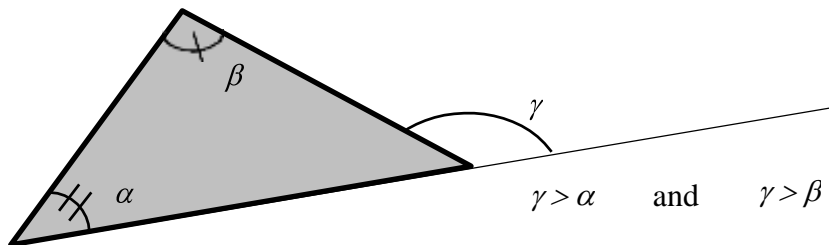
PROBLEM 8.1 EUCLID'S EXTERIOR ANGLE THEOREM (EEAT)

$\gamma > \alpha$ and $\gamma > \beta$

Figure 8.1 EEAT

a. *Any exterior angle of a triangle is greater than each of the opposite interior angles.*
Warning: Euclid's EAT is not the same as the Exterior Angle Theorem usually studied in high school.