Assignment #4
Parallel Equivalences
Due on Friday, 7 February.*

We have seen that Postulate V (in the presence of the other Postulates) implies Playfair's Postulate (Proposition I-31) and that the sum of the interior angles of a triangle is equal to two right angles (Postulate I-32). In fact, each of these assertions implies the other, as well as Postulate V. In this assignment we – {cough} – you will complete the proof that all three are equivalent.

1. Show directly that Playfair's Postulate implies that the sum of the interior angles of a triangle is equal to two right angles. *[5]*

2. Show directly that Postulate V is true if the sum of the interior angles of any triangle is equal to two right angles. *[5]*

Note. There are many other equivalents of Postulate V, assuming the other Postulates are true. For one non-obvious example, Postulate V is equivalent to the existence of a single square.

Arithmetic

Arithmetic is where numbers fly like pidgeons in and out of your
    head.
Arithmetic tells you how many you lose or win if you know
    how many you had before you lost or won.
Arithmetic is even eleven all good children go to heaven
    or five six bundle of sticks.
Arithmetic is numbers you squeeze from your head to your
    hand to your pencil to your paper till you get the answer.
Arithmetic is where the answer is right and everything is nice
    and you can look out of the window and see the blue sky
    or the answer is wrong and you have to start all over
    and try again and see how it comes out this time.
If you take a number and double it and double it again and
    then double it a few more times, the number gets biggger
    and bigger and goes higher and higher and only arithmetic
    can tell you what the number is when you decide to quit
    doubling.
Arithmetic is where you have to multiplyand you carry the
    multiplication table in your head and hope you won't
    lose it.
If you have two animal crackers, one good and one bad, and
    you eat one and a striped zebra with streaks all over him
    eats the other, how many animal crackers will you have
    if somebody offers you five six seven and you say No no
    no and you say Nay nay nay and you say Nix nix nix?
If you ask your mother for one fried egg for breakfast and she
    gives you two fried eggs and you eat both of them, who
    is better in arithmetic, you or your mother?

Carl Sandburg