A Guide to: A Tour of the Calculus

☞ For a Spanish Translation. There is a copy of this text On Reserve in the library.

Much of this book is easy, light reading, partly because it should be familiar material and partly because it is nontechnical and actually humorous. Here's an outline of the the sections. You might try to read it in the ten chunks outlined below. I encourage you to read the first six chapters (39 pages) before the start of the term.

1. The first six chapters (pages 1 to 39) should be read as a single unit. The focus is on *numbers*.
   (*a*) Chapter 1: Background on Newton and Leibniz. Easy reading
   (*b*) Chapter 2: See the discussion of the rational numbers on page 14.
   (*c*) Skim Chapters 3 and 4 on number lines and coordinate axes. Familiar turf.
   (*d*) Chapters 5 and 6: A review of the proof that $\sqrt{2}$ is not rational.
2. Chapters 7 and 8 (pages 40 to 53): An introduction to Dedekind cuts. Chapter 7 is a homage to Wallace Stevens' famous poem, "Thirteen Ways of Looking at a Blackbird" which you can read on the back of this sheet. Skim the Appendix to Chapter 8.
3. Skim Chapters 9 to 11 (pages 54 to 91) which discuss functions. Familiar stuff.
4. Chapters 12 and 13 (pages 92 to 117): An introduction to speed (and hence preparation for limits and the derivative). Read the Appendix to Chapter 13 carefully. It discusses Archimedes' Axiom which we will encounter.
5. Chapters 14 and 15 (pages 118 to 154): An introduction to limits and continuity. There's a nice discussion of the sign of three: *boundedness, betweenness, and maximality*—important properties of continuous functions on closed intervals that we will consider in great detail. There are some nice theorems here. The Appendices to Chapter 15 discuss the Intermediate Value Theorem and the Limit of a Function more carefully.
6. Chapters 16 and 17 (pages 155 to 189): An introduction to the derivative.
7. Chapters 18 and 19 (pages 190 to 216): A discussion and proof of Rolle's Theorem and the very important Mean Value Theorem.
8. Chapter 20 (pages 217 to 242): Antidifferentiation.
9. Chapters 21 to 23 (pages 243 to 273): Area (integration as opposed to antidifferentiation) including the Mean Value Theorem for Integrals.
10. Chapters 24 and 25 (pages 274 to 303): The Fundamental Theorem of Calculus.

Thirteen Ways of Looking at a Blackbird

Wallace Stevens

I
Among twenty snowy mountains,
The only moving thing
Was the eye of the blackbird.

II
I was of three minds,
Like a tree
In which there are three blackbirds.

III
The blackbird whirled in the autumn winds.
It was a small part of the pantomime.

IV
A man and a woman
Are one.
A man and a woman and a blackbird
Are one.

V
I do not know which to prefer,
The beauty of inflections
Or the beauty of innuendoes,
The blackbird whistling
Or just after.

VI
Icicles filled the long window
With barbaric glass.
The shadow of the blackbird
Crossed it, to and fro.
The mood
Traced in the shadow
An indecipherable cause.

VII
O thin men of Haddam,
Why do you imagine golden birds?
Do you not see how the blackbird
Walks around the feet
Of the women about you?

VIII
I know noble accents
And lucid, inescapable rhythms;
But I know, too,
That the blackbird is involved
In what I know.

IX
When the blackbird flew out of sight,
It marked the edge
Of one of many circles.

X
At the sight of blackbirds
Flying in a green light,
Even the bawds of euphony
Would cry out sharply.

XI
He rode over Connecticut
In a glass coach.
Once, a fear pierced him,
In that he mistook
The shadow of his equipage
For blackbirds.

XII
The river is moving.
The blackbird must be flying.

XIII
It was evening all afternoon.
It was snowing
And it was going to snow.
The blackbird sat
In the cedar-limbs.