

# Honors Calculus

Math 222H is our Honors calculus course directed at students who already have credit for calculus 1 or even calculus 2 and a strong record of performance in mathematics (like a high score on the calculus AP exam). It is appropriate for strong and mathematically curious students ready to work hard. It can be taken instead of Math 226/227. Honors calculus is designed for students who

- Seek to go beyond the norms of elementary calculus.
- Desire to know *why* theorems are true.
- Thirst to understand the foundations upon which calculus is built.
- See and want to know more about the beauty of mathematics.
- Want to build a strong foundation for more advanced math courses.
- Find the following formulas irresistibly beautiful:

$$\frac{2}{1} - \frac{2}{3} + \frac{2}{5} - \frac{2}{7} + \frac{2}{9} - \dots = \frac{\pi}{2} = \frac{2}{1} \cdot \frac{2}{3} \cdot \frac{4}{3} \cdot \frac{4}{5} \cdot \frac{6}{5} \cdot \frac{6}{7} \cdot \frac{8}{7} \cdot \frac{8}{9} \dots$$

Honors calculus covers much of the curriculum of calculus I and II, such as continuity, derivatives, integrals, infinite sequences and series, and the standard transcendental functions. However, in honors calculus we focus on conceptually understanding all that we do. Also, instead of mindless computations, we emphasize *proofs* and *rigor* and students taking honors calculus will be expected to understand and write proofs. Furthermore, in addition to the standard curriculum, we will cover more advanced material not usually covered in an elementary calculus course.

A student taking honors calculus will be expected to

- Attend every class.
- Do every homework at the highest level possible for the student.
- Study and review the class material on a daily basis.

A student successful in honors calculus would normally continue in the spring semester to Math 323 (vector calculus) or Math 330 (introduction to higher mathematics) or both, or possibly higher level courses.

The prerequisite for honors calculus is having credit for calculus 1 and a strong record of excellent performance in mathematics courses. As a minimum, students should have a score of 4 or 5 on the AP calculus exam, or a score of 6 or 7 on the IB Math HL, a grade of B or better on the Calculus 1 course taken at a college, or other similar evidence of success in math courses. If you have questions about your eligibility or have general questions about this course, please contact Prof. Paul Loya at the email [loya@math.binghamton.edu](mailto:loya@math.binghamton.edu).