
General Remarks: Any material covered in class may be on the exam; absence from this review sheet does not guarantee absence from the exam.

Ideas and methods:

- The method of section/scissors congruence; ancient notions of "area".
- The method of exhaustion. Measuring the area and circumference of the circle and other simple curvilinear figures. Volumes of spheres, cylinders and similar. Greek double contradiction proofs.
- Indivisibles. Kepler’s indivisibles, quadrature of $y = x^n$ by Pascal, Fermat. Cavalieri’s principle, Wallis’s index and quadrature of parabolas whose index is not a positive integer.
- Early tangent methods: Fermat’s method, Descartes’ circle method, Barrow’s infinitesimal method. Rules of Hudde.
- Infinite series before Newton: Mercator’s series for the logarithm, Wallis’ infinite product expression for $\pi$.
- Leibniz: Sequences and differences. Differentials and integrals.
- Euler: The exponential and logarithm series. Euler’s constant $e$. Euler’s formula relating sine, cosine and exponential function.

On the exam: In addition to the historical question that will be posted Friday, March 16, there will be 8 mathematical problems, one taken from each week that homework was assigned or practice problems posted.