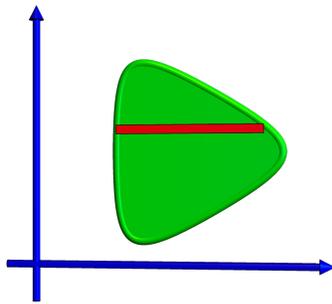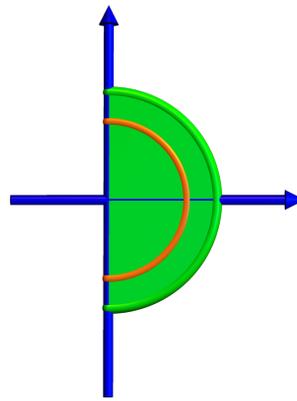# Review points in pictures

2D SLICING
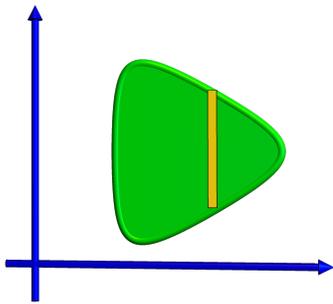
A) Vertical slicing   B) Horizontal slicing   C) Circular slicing
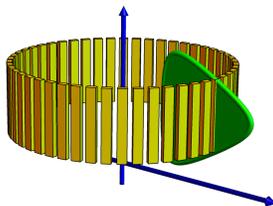
A) How to write down the Riemann sum and the integral?
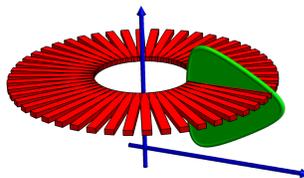
B) How is the integral modified with density?

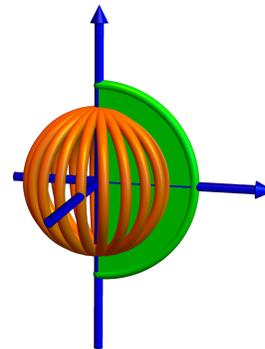C) Do you know what Δx and x_k are?

3D SLICING

A) Cylindrical shells   B) Disks or Washers   C) Spherical shells

D) Do you remember how to write down the Riemann sum and the integral?

E) Do you see how to integrate density? What does it mean to have volume?

F) Do you know when to use which slices?

INTEGRATION

$$\int \frac{1}{1+x^2}\,dx = \arctan(x) \quad \int \frac{1}{x\ln(x)}\,dx = \ln(\ln(x)) \quad \int xe^x dx = (x-1)e^x$$
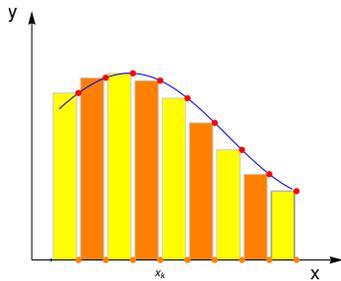
A) Knowing integrals B) Substitution C) Integration by parts

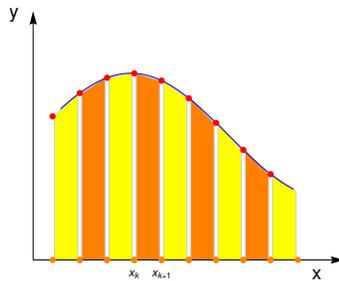G) Do you remember at least 10 anti derivatives off the bat?

H) Do you master substitution? Explain it in an example!

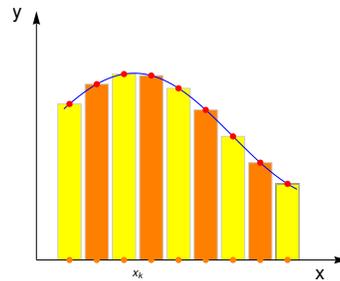I) Do you master integration by parts? Explain it in an example!

NUMERICS

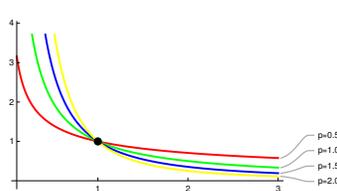A) Right Riemann sums B) Trapezoid rule C) Midterm rule

J) Do you know what effect monotonicity has on the numerical methods?
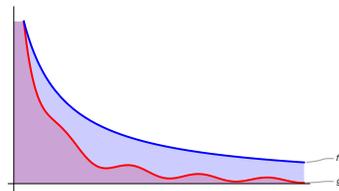
K) Do you know what effect the concavity has on the numerical methods?

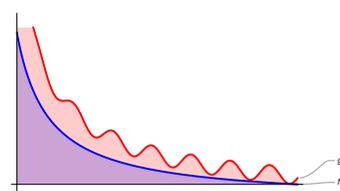L) Do you know the ingredients of the error bounds?

IMPROPER

A) p-functions B) Upper Estimate C) Lower Estimate

M) Do you know for which p the integral from 1 to ∞ converges?

N) Do you know for which p the integral from 0 to 1 converges?

O) Do you master the comparison test either for showing convergence or divergence?