General Stuff

- Office Hours

  T: 12:30 - 1:30, Th: 10 - 11

- Lab 07 due tonight.

  Let me know if Segments and Estimate don't work for you

- Midterm 4 on Thursday (3/18)

- Topics include probably 5.5 and chapter 4 material. Probably 7.1 as well.

  2 problems

  30 minutes to take exam

  5-10 minutes to upload to gradescope

  11:15 - 11:25 questions before quiz

  11:25 - 11:55 quiz

  11:55 - 12:05 uploading

Scalar Line Integral vs Vector Line Integral

1. Calculate the integral
$$\int_C \cos(z)\, dx + \sin(z)\, dy + (x + y)\, dz$$
where C is the helix $c(t) = (-\sin(t), \cos(t), t)$.

2. Suppose a wire can be parametrized as the intersection of the plane $z = y+2$ and $x^2+y^2 = 4$. Suppose the mass density function is given by $m(x, y, z) = z(x^2 + y^2 + 1)$. Find the total mass of the wire.

3. Suppose a force field on $\mathbb{R}^2$ is given by $F(x, y) = (x + y, x^2 - y)$. Find the work done by F on a particle moving along the trajectory given by $p(t) = (t, t^2 - t + 1)$.

4. Consider the circle of radius 1 given by $c(t) = (\cos(t), \sin(t))$. Consider the parametrization of $d(t) = (\sin(t), \cos(t))$. Determine some new bounds for d which agree with c, and determine whether d is orientation preserving or reversing.

5. Find the arclength of the graph $y = \ln(\sec(x))$ from $x = 0$ to $x = \pi$.