32B Killip Homework 5 Due May 8

(1) From Section 17.1, problems 4, 16, 24 (both editions).

(2) Compute the gradient field of $\frac{1}{4}(x^2 + y^2)$ and sketch it.

(3) Consider the curve $\big(x(t), y(t), z(t)\big)$ in space as t varies over $[0, T]$. We could also parameterize this curve by

$$\big(x(\tau^2), y(\tau^2), z(\tau^2)\big) \qquad \tau \in [0, \sqrt{T}].$$

Show that one obtains the same value for the line integral $\int_C f\, ds$ using either parameterization.

(4) From Section 17.2: 6, 12, 14, 30(a), 40.
(In 5th Ed, these are problems 6, 12, 14, 26(a), 38)