

**Assignment Due:** Thursday, October 23, 2019, 11:59pm

**Textbook Reading:** Sections: 14.7, 13.3, 15.1.

Make notes in your study journal if you encounter any difficulty with understanding this material and seek assistance at the Calculus Workshop (CW).

1) **Calc3 Online**

Login in to WebAssign, and complete all Assignments for **HW-6**. It is expected that you work through the problems in your study journal before entering the answers online — your saved written work is your study material for the exams.

- [Section 13.3](#)
- [Section 15.1](#)

2) **Instructor's Questions**

a) Let  $f(x, y) = 2x^2 - x + y^2$  and  $E$  be the set

$$E = \{(x, y) \mid x \geq 0, y \geq 0, x^2 + 4y^2 \leq 16\}.$$

Find all the local maximum and minimum values of  $f$  on  $\mathbb{R}^2$ . Then find the absolute maximum and minimum values of  $f$  on  $E$ .

b) Let  $\mathcal{C}$  be the curve parametrized by

$$\vec{r}(t) = \sin(2t)\vec{i} + \cos(2t)\vec{j} + 3t\vec{k}.$$

- (i) Sketch the curve from the point  $P(0, 1, 3\pi)$  to  $Q(0, 1, 6\pi)$ . Remember to include its orientation.
- (ii) Find the arc length of  $\mathcal{C}$  from  $P$  to  $Q$ .
- (iii) Reparametrize  $\mathcal{C}$  using its arc length starting from  $P$ . Then find its curvature at  $P$ .
- (iv) Without the reparametrization in part (iii), find the curvature at  $P$  by using  $\vec{r}(t)$  directly. Compare your answer with part (iii). Do they agree?