exercise 1:
(i). Let $f : \mathbb{R}^2 \to \mathbb{R}$ be defined by $f(x, y) = \dfrac{x + y}{\sqrt{x^2 + y^2}}$, if $(x, y) \neq 0$ and $f(0, 0) = C$, where $C$ is a constant. Is there a constant $C$ such that $f$ is continuous at $(0, 0)$?
(ii). Same question for $g : \mathbb{R}^2 \to \mathbb{R}$ be defined by $g(x, y) = \dfrac{x^2 + 2y^2}{\sqrt{x^2 + y^2}}$, if $(x, y) \neq 0$ and $g(0, 0) = C$.

From https://openstax.org/books/calculus-volume-3/pages/4-3-partial-derivatives
exercise 2: 117
exercise 3: 119, 122
exercise 4: 128
exercise 5: 130

exercise 6:
(i). Find with proof, the point of the parabola with equation $y = x^2$ where the curvature is maximal.
(ii). For any positive number $c$, is there a point on that parabola where the cutvature is less than $c$?

More textbook problems
https://openstax.org/books/calculus-volume-3/pages/4-4-tangent-planes-and-linear-approximations
https://openstax.org/books/calculus-volume-3/pages/4-7-maxima-minima-problems
exercise 7: 171, 174
exercise 8: 310, 312
exercise 9: 345