Marin Filipowski—Tangent Plane

1. Find the equation of the tangent plane to the graph of $f(x,y) = \ln(3x+y)$ at (-1,4).
2. Find the equation of the tangent plane to the graph of $f(x,y) = y\cos(xy)$ at $(\pi,2)$.

Mia Jeanty—Gradient/Critical Points

1. Find the critical points for the function $f(x,y) = -2x^2 - 4y^2 - 4x + 16y + 10$.
2. Find the critical points for the function $f(x,y) = 9x^2 + 3x^2y^3$.
3. Find the critical points for the function $f(x,y) = \frac{5}{x^2+y^2-1}$

Jeffrey Okeke—Saddle Points

1. Determine whether the function $f(x,y) = x^2 - 4xy + y^2 + 10y + 4$.
2. Determine whether the function $f(x,y) = x^2 + xy + 2x + y - 1$.

Luke Emery—Local Minimum

1. Find the local max, min, and saddle points of the function $f(x,y) = -8xy - 2y^4 - 2x^4$. Calculate their values.
2. Find the local max, min, and saddle points of the function $f(x,y) = e^{3x^2+y^2-18x}$. Calculate their values.

Scott DellaRocca—Borders

1. Find the parametric equations of the borders of the function $f(x,y) = x^2+4y^2-2x^2y+4$ on the rectangle D = $-1 \leq x \leq 1, -1 \leq y \leq 1$.
2. Find the parametric equations of the borders function $f(x,y) = 3+xy-x-2y$ on the domain bounded by y = 0, x = 1, y = -x+5.

Khalil Ulmer—Absolute Maximum/Minimum for Rectangles

1. For the function $f(x,y) = 12y + 2x^2 - 16x - 3y^2 + 4$ on the rectangular plate
$$0 \leq x \leq 8\,, \qquad 0 \leq y \leq 24$$
    a. Sketch the domain.
    b. Find and plot the absolute maximum(s) and absolute minimum(s) candidates.
    c. Find and plot the critical point.
    d. Determine the absolute maximum(s) and minimum(s).

2. For the function $f(x,y) = x^2+xy+y^2-9x+3$ on the rectangular plate $0 \leq x \leq 7, -4 \leq y \leq 0$
    a. Sketch the domain.
    b. Find and plot the absolute maximum(s) and absolute minimum(s) candidates.
    c. Find and plot the critical point.
    d. Determine the absolute maximum(s) and minimum(s).

Neil Surrett—Absolute Maximum/Minimum for Triangles

1. Find the absolute maximum and minimum of the function $f(x,y) = 2x^2-4x+y^2-4y+1$ on the closed triangular plane bounded by the lines x=0, y=2, y=2x in the first quadrant.

2. Find the absolute maximum and minimum of the function on the given domain f(x,y) = $8x^2+5y^2$ on the closed triangular plate bounded by the lines x=0, y=0, y+2x = 2 in the first quadrant.

Colton Mock—Local Maximum

1. Find the coordinate and value of all local max/min for the following functions:
    a. f(x,y) = $-6x^2-6xy-4y^2-42x-26y+5$
    b. f(x,y) = $\sqrt{30x^2 - 7y^2 - 12x - 23} + (1 - 6x)$
    c. f(x,y) = $4-\sqrt[7]{x^2 + y^2}$