Lab Worksheet for September 28, 2021

Practice with Implicit Differentiation.

1.Consider the shape formed by the equation $x^2 – y^2 = 4$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point (2, 0).

2. Consider the shape formed by the equation $x^4y – xy^3 = -2$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point (-1, -1).

3. Consider the shape formed by the equation $x^2y^2 + 5xy = 14$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point (2, 1).

4. Consider the shape formed by the equation tan(xy) = y

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point $(\frac{\pi}{4}, 1)$.

5. Consider the shape formed by the equation $xy^2 + \sin(\pi y) - 2x^2 = 10$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point (2, -3).

6. Consider the shape formed by the equation $\frac{x}{y} + 5x - 7 = -\frac{3}{4}y$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point (1, 2).

7. Consider the shape formed by the equation $xy + \sin(x) = 1$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point $(\frac{\pi}{2}, 0)$.

8. Consider the shape formed by the equation $6x^2 + 3y^2 = 12$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point (0, 2).

9. Consider the shape formed by the equation $xy - \cos(y) = 1$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point $(0,-\pi)$.

10. Consider the shape formed by the equation $x^4 + y^2 = 1$

(a) Write down the formula for the slope of the tangent line to this shape at a point (x, y) on this shape.

(b) Find the slope of the tangent line to this shape at the point (0, 1).