Math 9 Fall 19 Homework 5 (Due on Oct 23 before class)

(1) (3pts) Linear Algebra 3.3.17

(2) (3pts) Linear Algebra 3.2.19

(3) (3pts) Linear. Algebra 3.2.21

(4) (3pts) Linear Algebra 3.2.25. In general, $\mathrm{Det}(AB) = \mathrm{Det}(A)\mathrm{Det}(B)$. You will verify this property for 2×2 matrices.

(5) (3pts each) For each part of the problem, find the limit, if it exists, or show that the limit does not exist.

(a)
$$\lim_{(x,y)\to(1,0)} \frac{2xy - 2y}{(x-1)^2 + y^2}$$

(b)
$$\lim_{(x,y)\to(0,0)} \frac{2yx^4}{x^4 + y^4}$$

(c)
$$\lim_{(x,y)\to(0,0)} \frac{2xy^4 \cos x}{x^2 + y^8}$$

(6) (3pts) Linear Algebra 4.1.6

(7) (3pts) Find a scalar equation of the tangent plane to the graph of $f(x, y) = x^2 + 2y^2$ at the point $(1, 1, 3)$.