Name _____ Date _____

<u>Instructions</u>: Please show all of your work as partial credit will be given where appropriate, **and** there may be no credit given for problems where there is no work shown. All answers should be completely simplified, unless otherwise stated.

1. Let $f(x,y)=\dfrac{3xy^3-2\sqrt{x^2+2y^4}}{x^2+y^2}$.

(a) Find $f(2,1)$ = _____

(b) Find $f(t,t^2)$ = _____

(c) What is the domain?   Domain: _____

2. Find the slope of the tangent to the curve of intersection of the surface $z = 4x^2 + 3y - 7$ and the plane $y = 1$ at the point $(2, 1, 12)$.

slope = _____

3. Find the limit (or show that it does not exist).

(a) $$\lim_{(x,y)\to(0,0)} \frac{\tan\sqrt{x^2+y^2}}{4\sqrt{x^2+y^2}} \quad .$$

Answer : _____

(b) $$\lim_{(x,y)\to(0,0)} \frac{4x^2 y}{x^3 + y^3}$$

Answer: _____