MATH 2415 Test 3 Name: _____

1. If an object's current position is given in polar coordinates by $(r, \theta) = (5, \pi/3)$ and its current velocity satisfies $dx/dt = 4$ and $dr/dt = 7$, then what is the current value of $d\theta/dt$?

2. Consider these two-variable limits:

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

Circle those limits above that exist. (Proofs not required.)