1.(pts.) (a) A complex number z is an ordered pair (x, y) of real numbers with addition and multiplication defined as:

(b) The complex number i is defined as the ordered pair:

(c) The modulus, complex conjugate, and polar form of the complex number $z = (1,1) = 1 + i$ are, respectively:

(d) Euler's formula is $e^{i\theta} =$

2.(pts.) (a) A subset S of the complex plane is called a domain if:

(b) Give an example of a set S of complex numbers which is a domain.

(c) Give an example of a set S of complex numbers which is not a domain and tell why.

(d) The Riemann sphere is:

(e) The stereographic projection maps _____ onto _____

_____.

(f) A neighborhood of the point at infinity (denoted ∞) is:

(g) The extended complex plane is:

3.(pts.) (a) We say that the complex number w_0 is the limit of the function $f = f(z)$ as z approaches z_0 provided: