Name:_____   Section: 100

Please complete the following exercises. You may collaborate with your classmates, consult your notes or text, and/or ask for help. Note that participation in this activity is not optional.

1. Simplify each quantity (you may use polar form for convenience).

   (a) i^i

   (b) $i^{\pi i}$

   (c) $(1+i)^i$

   (d) $(-1)^{1/\pi}$

   (e) $(-1)^{2/\pi}$

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2. Consider the function $f(z) = z^\alpha$ for some unknown number α. (Assume the "worst case," meaning α is not an integer or anything special.)

(a) Write $f(z)$ using exponential/logarithmic functions.

(b) Where is $f(z)$ analytic?

(c) What happens if you restrict x to a real number and consider $f(x)$?

(d) Explain the difference between the multivalued and principle valued version of $f(z)$.