Name:————————————————————

Please complete the following exercises. Please answer individually (no collaboration).

1. Simplify each quantity to the form $a + bi$:
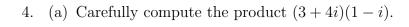
   (a) $(3 - 2i) + (1 - 3i)$

   (b) $(2 + i)^4$

   (c) $(2 + i)^{-2}$

   (d) $\frac{i}{1+i}$

   (e) $|1 - 2i|$

2. Find the roots of the quadratic equation $z^2 - 2z + 3$.

OVER

.

3. Use a calculator (or your phone) to determine $e^{\pi i}$. (Please do not use this device for any other problem.) Does the answer surprise you?

4. (a) Carefully compute the product $(3 + 4i)(1 - i)$.

   (b) Find $|3 + 4i|$ and $|1 - i|$. Then find the absolute value (now also known to us as "modulus") of your answer to the previous qustion.

   (c) How do your previous answers compare?