Exercise 8

January 12, 2021 (Due: January 19, 2021)

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Please explain and show your work!

1. Let $z_1 = 5+4i$ and $z_2 = 6+5i$. Please evaluate the following expressions.

(a) $z_1 + z_2$ $= (5+4i) + (6+5i)$

$= (5+6) + (4+5)i$

$= 11 + 9i$

(b) $\overline{z_2}$ $z_2 = 6+5i$

$\overline{z_2} = 6-5i$

(c) $z_1 \times \overline{z_2}$ $= (5+4i) \cdot (6-5i)$

$= 5(6-5i) + 4i(6-5i)$

$= 30 - 25i + 24i - 20(-1)$

$= 50 - 1i$

(d) $|z_2|$ $z_2 = 6+5i$

$|z_2| = \sqrt{6^2+5^2} = \sqrt{36+25}$

$= \sqrt{61}$

(e) $\frac{z_1}{z_2}$ $= \frac{5+4i}{6+5i}$

$= \frac{(5+4i)(6-5i)}{(6+5i)(6-5i)} = \frac{50+1i}{61} = \frac{50}{61} + \frac{1}{61}i$