Complex Number Practice

Consider the following numbers:

$$
\begin{aligned}
z_1 &= 1 + i \, , \\
z_2 &= -2i \, , \\
z_3 &= 3 \, .
\end{aligned}
$$

1. Compute the following:

   (a) $z_1 + z_2$
   (b) $z_1 z_2$
   (c) $z_2 - z_3$
   (d) $z_3 z_1$
   (e) $z_1^* z_1$
   (f) $z_2^* z_2$

2. Convert z_1 and z_2 into polar form. Use radians.

3. Consider the following three numbers:

$$
\begin{aligned}
z_4 &= e^{i\alpha} \, , \\
z_5 &= e^{i\beta} \, , \\
z_6 &= z_4 z_5 \, .
\end{aligned}
$$

   where α and β are real constants.

   (a) Find z_6 in polar form
   (b) Compute $z_4 z_4^*$
   (c) Compute $z_5 z_5^*$
   (d) Compute $z_6 z_6^*$