HOMEWORK #15 prob 5 solution

Ex: If $z_1 = j$, find a complex number, z_2, such that $z_1 + z_2 = z_1 z_2$. Express z_2 in rectangular (i.e., $a + jb$) form.

Sol'n: Isolate z_2.

$$z_1 = z_1 z_2 - z_2 = (z_1 - 1) z_2$$

or

$$z_2 = \frac{z_1}{(z_1 - 1)}$$

Substituting the value of z_1 and rationalizing gives the answer.

$$z_2 = \frac{j}{j-1} = \frac{j}{j-1} \cdot \frac{-j-1}{-j-1} = \frac{1-j}{1^2 + 1^2} = \frac{1}{2} - j\frac{1}{2}$$