

EJERCICIO MIBES456:

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$$z_1 = 2 + 3i$$

$$z_2 = 3 - 5i$$

$$a) \boxed{z_1 + z_2} = (\boxed{2} + \boxed{3i}) + (\boxed{3} - \boxed{5i}) = \boxed{5 - 2i}$$

$$b) \boxed{z_1 - z_2} = (2 + 3i) - (3 - 5i) = \boxed{-1 + 8i}$$

$$\begin{aligned} c) \boxed{z_1 \cdot z_2} &= (2 + 3i) \cdot (3 - 5i) = \\ &= 6 - 10i + 9i - 15i^2 = \quad (i^2 = -1) \\ &= 6 - i - 15(-1) = \\ &= 6 + 15 - i = \boxed{21 - i} \end{aligned}$$

$$\begin{aligned} d) \frac{\boxed{z_1}}{\boxed{z_2}} &= \frac{(2 + 3i)(3 + 5i)}{(3 - 5i)(3 + 5i)} = \\ &= \frac{6 + 10i + 9i + 15i^2}{3^2 - (5i)^2} = \quad \xrightarrow{-1} \\ &= \frac{6 + 19i + 15(-1)}{9 - 25i^2} = \quad \xrightarrow{-1} \\ &= \frac{-9 + 19i}{9 + 25} = \boxed{\frac{-9}{34} + \frac{19}{34}i} \end{aligned}$$

$$\begin{aligned} e) \boxed{(z_1)^2} &= (2 + 3i) \cdot (2 + 3i) = \quad \xrightarrow{-1} \\ &= 4 + 6i + 6i + 9i^2 = \\ &= 4 + 12i - 9 = \\ &= \boxed{-5 + 12i} \end{aligned}$$