

$$a) \quad z^2 - 20z + 109 = 0$$

$$z = 10 \pm \sqrt{10^2 - 109} = 10 \pm \sqrt{-9} = 10 \pm 3i$$

så

$$z_1 = 10 + 3i, \quad z_2 = 10 - 3i$$

$$z_1 + z_2 = 10 + 3i + 10 - 3i = 20$$

$$z_1 \cdot z_2 = (10 + 3i)(10 - 3i) = 100 + 9 = 109$$

$$b) \quad z^2 + pz + q = 0$$

$$z = -\frac{p}{2} \pm \sqrt{\frac{p^2}{4} - q}$$

$$z_1 + z_2 = -\frac{p}{2} + \sqrt{\quad} + \left(-\frac{p}{2}\right) - \sqrt{\quad} = -p$$

$$z_1 \cdot z_2 = \left(-\frac{p}{2} + \sqrt{\quad}\right) \left(-\frac{p}{2} - \sqrt{\quad}\right) =$$

$$= \frac{p^2}{4} - \left(\sqrt{\quad}\right)^2 = \frac{p^2}{4} - \left(\frac{p^2}{4} - q\right) = q$$