

Solve the following equation. $(w^2 - 2)^2 + 4(w^2 - 2) - 12 = 0$

$$(w^2 - 2)^2 + 4(w^2 - 2) - 12 = 0$$

Let $x = w^2 - 2$, and solve $x^2 + 4x - 12 = 0$.

$$(x + 6)(x - 2) = 0$$

$$x = -6 \text{ or } x = 2$$

$$\text{So } w^2 - 2 = -6 \text{ or } w^2 - 2 = 2$$

$$w^2 = -4 \text{ or } w^2 = 4 \text{ and we obtain } w = \pm 2i \text{ or } w = \pm 2.$$