4 The polynomial $\mathrm{p}(x)$ is defined by

$$\mathrm{p}(x) = x^4 - 10x^3 + 20x^2 - 30x + 40.$$

(a) Find the quotient when $\mathrm{p}(x)$ is divided by $\left(x^2 + 3\right)$ and show that the remainder is -11. [3]

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(b) Hence find the real roots of the equation $\mathrm{p}(x) + 11 = 0$. Give your answers in exact form. [3]

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