**Using the Factor Theorem**

(a) Show that $(x-2) $is a factor of $x^{3}+x^{2}-4x-4$.

(b) Show that $(x-3) $is a factor of $2x^{3}+x^{2}-18x-9$.

(c) Show that $(x-1) $is a factor of $4x^{3}-3x^{2}-1$.

(d) Show that $(x+1) $is a factor of $x^{3}-10x^{2}+19x+30$.

Factorise fully:

(a) $x^{3}+x^{2}-4x-4$

(b) $x^{3}-10x^{2}+19x+30$

(c) $x^{3}-4x^{2}-11x+30$

Solve:

(a) $2x^{3}+x^{2}-18x-9=0$

(b) $x^{3}-7x^{2}+2x+40=0$

(c) $x^{3}-5x^{2}+5x+3=0$

$(x+2)$ and $(x-3)$ are both factors of the cubic $x^{3}+ax^{2}+bx+18$. Find the values of$ a$ and $b$.

$(x+2)$ and $(x-4)$ are both factors of the cubic $x^{3}+3x^{2}+ax+b$. Find the third factor of this cubic.

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