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 $x^3-10x^2+19x+30$.

(a) $f(2)=0$ hence $(x-2)$ is a factor

(b) $f(3)=0$

(c) $f(1)=0$

(d) $f(-1)=0$

Factorise fully:

(a) x^3+x^2-4x-4

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

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

(a) $(x-2)(x+2)(x+1)$

(b) $(x+1)(x-6)(x-5)$

(c) $(x-2)(x-5)(x+3)$

Solve:

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

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

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

(a) $x=3,\ x=\frac{-1}{2},\ x=-3$

(b) $x=-2,\ x=5,\ x=4$

(c) $x=3,\ x=1+\sqrt{2},\ x=1-\sqrt{2}$

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

$a=-4,\ b=-3$

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

$a=-18\quad b=-40$