Question number	Scheme	Marks
2 **(a)**	$f(4)=2\times4^3-3p\times4^2+4+4p=0\Rightarrow128+4=48p+4p\Rightarrow p=3$ *	M1A1 (2)
(b)	$f(-2)=2(-2)^3-9(-2)^2+(-2)+12=-42$	M1A1 (2)
(c)	$\frac{2x^3-9x^2+x+12}{x-4}=2x^2-x-3=(x+1)(2x-3)\Rightarrow$	M1A1
	$2x^3-9x^2+x+12=(x-4)(x+1)(2x-3)$	A1 (3)
(d)	$(x-4)(x+1)(2x-3)=0\Rightarrow x=4,x=-1,x=\frac{3}{2}$	M1A1 (2) **(9)**

Notes

(a)	M1	For **either** f (–4) **or** f (4), equating f (±4) = 0 and finding a value for *p*. For the award of this mark the method must be complete.
	A1	$p = 3$
(b)	M1	For **either** f (–2) **or** f (2) and finding a value for f (±2) using the given *p*. For the award of this mark the method must be complete. **Division** Divides by $(x+2)$ and achieves at least $2x^2-13x+k$ (complete method)
	A1	$f(-2)=-42$ or remainder of -42 using division
(c)	M1	Divides f (*x*) – by $(x-4)$ or $(x+1)$ any method, achieves at least $2x^2\pm ax\pm b$ where $a\neq0,\ b\neq0$, and attempts to factorise their 3TQ. (See general guidance for an acceptable attempt) Note: $(2x^3-9x^2+x+12)\div(x+1)=2x^2-11x+12$ **OR** by inspection; $(x-4)$ and $(x+1)$ are factors, hence third factor is $(2x\pm a)$
	A1	For achieving $2x^2-x-3=(x+1)(2x-3)$ or $2x^2-11x+12=(2x-3)(x-4)$
	A1	For the correct factorisation of f (*x*) = $(x-4)(x+1)(2x-3)$
(d)	M1	For setting f (*x*) = 0 (can be implied by further work) **and** attempting to solve a factorised f (*x*) = 0. ie., $(x\pm4)(x+'1')('2'x-'3')=0\Rightarrow x=\pm4,'-1','\frac{3}{2}'$
	A1	For $x=4,x=-1,x=\frac{3}{2}$ Note: answers must be derived from correct algebra