Question	Scheme	Marks
1(a)	$f(\pm 2) = a\times(\pm 2)^3 + 7(\pm 2)^2 \pm 46\times 2 + 24$	M1
	[Remainder is] $8a-40$	A1
		(2)
(b)	$8a-40=0 \Rightarrow a=5$ *	B1*
		(1)
(c)	$5x^3+7x^2-46x+24=(x-2)(5x^2+17x-12)$	M1 A1
	$5x^2+17x-12=(5x-3)(x+4)$	dM1
	$[f(x)]=(x-2)(5x-3)(x+4)$	A1
		(4)
		(7 marks)

Notes:

(a)

M1: Attempts $f(\pm 2)$

OR Polynomial Division

$$
\begin{array}{r|l}
 & ax^2+(7+2a)x+4a-32 \\
\hline
x-2 & ax^3+7x^2-46x+24 \\
 & \underline{ax^3-2ax^2} \\
 & (7+2a)x^2-46x+24 \\
 & \underline{(7+2a)x^2-2(7+2a)x} \\
 & (4a-32)x+24 \\
 & \underline{(4a-32)x-2(4a-32)} \\
 & 8a-40
\end{array}
$$

M1 for a complete method to obtain a quotient of $ax^2+f(a)x+g(a)$ where f(a) and g(a) are linear in a and then obtains a linear expression in a for the remainder.

OR Tabular method

	ax^2	$(7+2a)x$	$4a-32$
x	ax^3	$(7+2a)x^2$	$(4a-32)x$
-2	$-2ax^2$	$-2(7+2a)x$	$64-8a$

So remainder is $24-(64-8a)$

M1: A complete method as above and reaches a linear expression in a in the bottom right hand box and subtracts it from 24

A1: Correct expression in a [Accept $f(2)=8a-40$]