Algebraic Division 2 - Edexcel Past Exam Questions MARK SCHEME

Question 1

Question Number	Scheme	Marks
1 By Division	$$\begin{array}{r} 3x^2-2x+7 \\ x^2(+0x)-4\overline{)\,3x^4-2x^3-5x^2+(0x)-4} \\ \underline{3x^4+0x^3-12x^2} \\ -2x^3+7x^2+0x \\ \underline{-2x^3+0x^2+8x} \\ 7x^2-8x-4 \\ \underline{7x^2+0x-28} \\ -8x+24 \end{array}$$	
	$a=3$	**B1**
	Long division as far as $$\begin{array}{r} 3x^2-2x..... \\ x^2(+0x)-4\overline{)\,3x^4-2x^3-5x^2+(0x)-4} \\ \underline{3x^4+0x^3-12x^2} \\ -2x^3+..... \\ \underline{-2x^3+.....} \end{array}$$	**M1**
	Two of $b=-2 \quad c=7 \quad d=-8 \quad e=24$	**A1**
	All four of $b=-2 \quad c=7 \quad d=-8 \quad e=24$	**A1**
		(4 marks)

Notes for Question 1

B1 Stating $a=3$. This can also be scored by the coefficient of x^2 in $3x^2-2x+7$

M1 Using long division by x^2-4 and getting as far as the 'x' term. The coefficients need not be correct. Award if you see the whole number part as $...x^2+...x$ following some working. You may also see this in a table/ grid.
Long division by $(x+2)$ will not score anything until $(x-2)$ has been divided into the new quotient. It is very unlikely to score full marks and the mark scheme can be applied.

A1 Achieving two of $b=-2 \; c=7 \; d=-8 \; e=24$.
The answers may be embedded within the division sum and can be implied.

A1 Achieving all of $b=-2 \; c=7 \; d=-8$ and $e=24$

Accept a correct long division for 3 out of the 4 marks scoring B1M1A1A0

Need to see a=…, b=…, or the values embedded in the rhs for all 4 marks

Question Number	Scheme	Marks
Alt 1 **By Multiplication**	* $3x^4-2x^3-5x^2-4\equiv(ax^2+bx+c)(x^2-4)+dx+e$	
	Compares the x^4 terms $a=3$	B1
	Compares coefficients to obtain a numerical value of one **further** constant $-2=b,\quad -5=-4a+c\Rightarrow c=..,$	M1
	Two of $b=-2\quad c=7\quad d=-8\quad e=24$	A1
	All four of $b=-2\quad c=7\quad d=-8\quad e=24$	A1
		(4 marks)

Notes for Question 2

B1 Stating $a=3$. This can also be scored for writing $3x^4=ax^4$

M1 Multiply out expression given to get *. Condone slips only on signs of either expression.
Then compare the coefficient of any term (other than x^4) to obtain a numerical value of one further constant. In reality this means a valid attempt at either b or c
The method may be implied by a correct additional constant to a.

A1 Achieving two of $b=-2\ c=7\ d=-8\ e=24$

A1 Achieving all of $b=-2\ c=7\ d=-8$ and $e=24$

Question 2

Question	Scheme	Marks
	$x^2+x-6\overline{)x^4+x^3-3x^2+7x-6}$ $\quad x^2+3$ $x^4+x^3-6x^2$ $3x^2+7x-6$ $3x^2+3x-18$ $4x+12$	M1 A1
	$\frac{x^4+x^3-3x^2+7x-6}{x^2+x-6} \equiv x^2+3+\frac{4(x+3)}{(x+3)(x-2)}$	M1
	$\equiv x^2+3+\frac{4}{(x-2)}$	A1
		(4)