

ALGEBRAIC EXPRESSIONS MARKING SCHEME

NO	SOLUTION	MKS	
1.	$a^2 - 3ab - 12ab + 36b^2$ $a(a - 3b) - 12b(a - 3b)$ $(a - 12b)(a - 3b)$ <p style="text-align: right;">1989Q2</p>	2M	
2.	$\frac{(6a+b-7)(a+b)}{2(a^2-b^2)}$ $\frac{a(6a-6b)(a+b)}{2(a-b)(a+b)}$ $\frac{6(a-b)}{2(a-b)}$ $= \frac{6}{3}$ <p style="text-align: right;">1990Q3</p>	3M	
3.	$\frac{a(a-b)(a+b)}{2(a+b)(a-b)}$ $\frac{a^2 - ba + ba + b^2}{(2a+2b)(a-b)}$ $\frac{a^2 + b^2}{2a^2 - 2ab + 2ab - 2b^2}$ $\frac{a^2 + b^2}{2a^2 - 2b^2}$ $\frac{a^2 + b^2}{2(a^2 - b^2)}$ <p style="text-align: right;">1991Q8</p>	3M	
4.	$Ac = \left(\frac{b}{2}\right)^2$ $25d = \left(\frac{-70}{2}\right)^2$ $\frac{25d}{25} = \frac{1225}{25}$ $d = 49$ <p style="text-align: right;">1992Q6</p>	3M	
5.	$2x^2y^2 - 8xy + 3xy - 12$ $2xy(xy - 4) + 3(xy - 4)$ $(xy - 4)(2xy + 3)$ <p style="text-align: right;">1993Q1</p>	3M	
6.	$\frac{(x-2)(x-2) - (2x+20)}{(x+2)(x-2)}$ $\frac{x^2 - 4x + 4 + 2x - 20}{(x+2)(x-2)}$ $\frac{x^2 - 6x - 16}{(x+2)(x-2)}$ $\frac{x^2 - 8x + 2x - 16}{(x+2)(x-2)}$ $\frac{x(x-8) = 2 \cdot 2(x-8)}{(x+2)(x-2)}$ $\frac{(x+2)(x-8)}{(x+2)(x-2)}$ $= \frac{x-8}{x-2}$ <p style="text-align: right;">1993Q14</p>	4M	
7.	$28x^2 + 7x - 4x - 1$ $7x(4x + 1) - 1(4x + 1)$ $(4x + 1)(7x - 1)$ <p style="text-align: right;">1994Q2</p>	2M	
8.	$\left(\frac{2x-2}{6x^2-9x+8x-12}\right) \div \left(\frac{x-1}{2x-3}\right)$ $\left(\frac{2x-2}{3x(2x-3)+4(2x-3)}\right) \div \left(\frac{x-1}{2x-3}\right)$ $\left(\frac{2x-2}{(3x+4)(2x-3)}\right) \times \frac{x-1}{2x-3}$ $= \frac{2}{3x+4}$ <p style="text-align: right;">1995Q2</p>	3M	
9.	$\frac{(3x^2-1) - (2x-1)(x-1)}{(x-1)(x+1)}$ $\frac{(3x^2-1) - (2x^2-2x+1x-1)}{(x-1)(x+1)}$ $\frac{3x^2-1+2x+16}{(x-1)(x+1)}$ $\frac{x^2+x}{(x-1)(x+1)} = \frac{x(x+1)}{(x-1)(x+1)}$ $= \frac{x}{x-1}$ <p style="text-align: right;">1995Q8</p>	3M	

24.	$\begin{aligned} &(x^2-y^2)(x^2+y^2)(x^4-y^4) \\ &=9x^4-y^4)(x^4-y^4) \\ &=x^8-2x^4y^4+y^8 \end{aligned}$ <p style="text-align: center;">2007Q3</p>	A1 M1 2 M
25.	$\begin{aligned} \frac{15a^2b-10ab^2}{3a^2-5ab+2b^2} &= \frac{5ab(3a-b)}{(3a-2b)(a-b)} \\ &= \frac{5ab}{a-b} \end{aligned}$ <p style="text-align: center;">2007Q6</p>	M1 M1 A1 3 M
26.	$\begin{aligned} \frac{a^4-b^4}{a^3-ab^2} &= \frac{(a^2+b^2)(a^2-b^2)}{a(a^2-b^2)} \\ &= \frac{a^2+b^2}{a} \end{aligned}$ <p style="text-align: center;">2008Q3</p>	M1 M1 <u>A1</u> 3 M
27.	$\begin{aligned} \frac{12x^2+ax-6a^2}{9x^2-4a^2} \\ \frac{(4x+3a)(3x-2a)}{(3x+2a)(3x-2a)} \\ &= \frac{4x+3a}{3x+2a} \end{aligned}$ <p style="text-align: center;">2009Q8</p>	M1 M1 <u>A1</u> 3 M
28.	$\begin{aligned} &x^2 + x - 4xy - 4y - x(x + 1) \\ &(x + 1)(4y^2 - xy)(x + 1)(y)(4y - x) \\ &= (x - 4y)(x + 1) \\ &= -1/y \\ &(x + 1)(-y)(x - 4y) \end{aligned}$ <p style="text-align: center;">2010Q12</p>	M1 M1 <u>A1</u> 3
29.	$\begin{aligned} \frac{4x-9x^3}{3x^2-4x-4} &= \frac{x(2-3x)(2+3x)}{(3x+2)(x-2)} \\ \frac{x(2-3x)}{x-2} \end{aligned}$ <p style="text-align: center;">2011Q6</p>	M1 M1 <u>A1</u> 3
30.	$\begin{aligned} &2x^2y^2 - 5xy - 12 \\ &= 2x^2y^2 - 8xy + 3xy - 12 \\ &= 2xy(xy-4) + 3(xy-4) \\ &= (2xy + 3)(xy - 4) \end{aligned}$ <p style="text-align: center;">2011Q8</p>	M1 <u>A1</u> 2

31.	$\begin{aligned} &(2x^2 - 3y^3)^2 + 12x^2y^3 \\ &= 4x^4 - 12x2y^3 + 9y^6 + 12x^2y^3 \\ &= 4x^4 + 9y^6 \end{aligned}$ <p style="text-align: center;">2012 Q3</p>	M1 <u>A1</u> 2
32. (a)	$\begin{aligned} \frac{1}{x-2} - \frac{2}{x+5} &= \frac{3}{x+1} \\ \frac{x+5-2(x-2)}{(x-2)(x+5)} &= \frac{3}{x+1} \\ \frac{-x+9}{x^2+3x-10} &= \frac{3}{x+1} \\ 4x^2 + x - 39 &= 0 \\ (4x + 13)(x - 3) &= 0 \\ x = 3 \text{ or } x &= -3\frac{1}{4} \end{aligned}$	M1 A1 M1 A1
(b)	<p>Mean for second tests</p> $\begin{aligned} &= \frac{147}{y+2} \\ \frac{120}{y} - \frac{147}{y+2} &= 3 \\ \frac{120y+240-147y}{y(y+2)} &= 3 \\ -27y + 240 &= 3y^2 + 6y \\ -9y + 80 &= y^2 + 2y \\ -9y + 80 &= y^2 + 2y \\ y^2 + 11y - 80 &= 0 \\ (y - 5)(y+16) & \\ y=5 \text{ or } -16 & \end{aligned}$ <p>no. of tests: 5+2 = 7</p> <p style="text-align: center;">2012 Q20</p>	M1 B1 M1 M1 M1 <u>A1</u> 10

