

| Q | Marking Instructions | AO | Marks | Typical Solution |
|---|--|--------------|-------|--|
| 6 | Uses partial fractions with linear denominators $\frac{6x+1}{6x^2-7x+2} = \frac{A}{ax+b} + \frac{B}{cx+d}$ | AO3.1a | M1 | $\frac{6x+1}{6x^2-7x+2} = \frac{A}{3x-2} + \frac{B}{2x-1}$ $A(2x-1) + B(3x-2) = 6x+1$ |
| | Obtains correct linear denominators | AO1.1b | B1 | $x = \frac{2}{3}, A\left(\frac{1}{3}\right) = 5$ so $A = 15$ |
| | Obtains at least one numerator correct (using any valid method, eg equating coefficients or substitution of values) | AO1.1b | A1 | $x = \frac{1}{2}, B\left(-\frac{1}{2}\right) = 4$ so $B = -8$ $\int_1^2 \frac{15}{3x-2} - \frac{8}{2x-1} dx$ $= [5\ln(3x-2) - 4\ln(2x-1)]_1^2$ |
| | Obtains partial fractions completely correct | AO1.1b | A1 | $= 5\ln(4) - 4\ln(3) - (5\ln(1) - 4\ln(1))$ $= 10\ln(2) - 4\ln(3)$ |
| | Integrates 'their' partial fractions, must include logs $p\ln(ax+b) + q\ln(cx+d)$ | AO1.1a | M1 | |
| | 'Their' integral correct (ignore limits) | AO1.1b | A1F | |
| | Substitutes limits into 'their' integral | AO1.1a | M1 | |
| | Correct final answer in correct form CAO | AO1.1b | A1 | |
| | | Total | | 8 |