INTEGRATION

BY A SPECIAL MANIPULATION

Question 1

Carry out the following integrations:

1. $\displaystyle\int \frac{x+1}{x-1}\,dx = x+2\ln|x-1|+C$

2. $\displaystyle\int \frac{x-2}{x+2}\,dx = x-4\ln|x+2|+C$

3. $\displaystyle\int \frac{x+2}{x+5}\,dx = x-3\ln|x+5|+C$

4. $\displaystyle\int \frac{x-3}{x-8}\,dx = x+5\ln|x-8|+C$

5. $\displaystyle\int \frac{2x-3}{x+2}\,dx = 2x-7\ln|x+2|+C$

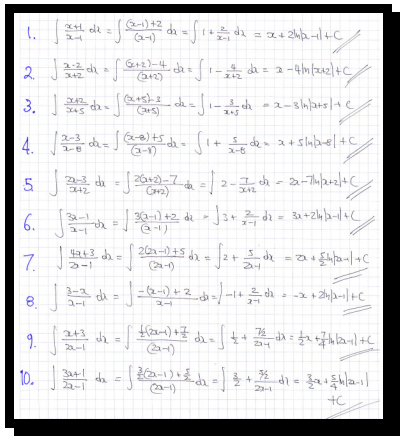
6. $\displaystyle\int \frac{3x-1}{x-1}\,dx = 3x+2\ln|x-1|+C$

7. $\displaystyle\int \frac{4x+3}{2x-1}\,dx = 2x+\frac{5}{2}\ln|2x-1|+C$

8. $\displaystyle\int \frac{3-x}{x-1}\,dx = -x+2\ln|x-1|+C$

9. $\displaystyle\int \frac{x+3}{2x-1}\,dx = \frac{1}{2}x+\frac{7}{4}\ln|2x-1|+C$

10. $\displaystyle\int \frac{3x+1}{2x-1}\,dx = \frac{3}{2}+\frac{5}{4}\ln|2x-1|+C$


1. $\int \frac{x+1}{x-1}\,dx = \int \frac{(x-1)+2}{(x-1)}\,dx = \int 1+\frac{2}{x-1}\,dx = x+2\ln|x-1|+C$
2. $\int \frac{x-2}{x+2}\,dx = \int \frac{(x+2)-4}{(x+2)}\,dx = \int 1-\frac{4}{x+2}\,dx = x-4\ln|x+2|+C$
3. $\int \frac{x+2}{x+5}\,dx = \int \frac{(x+5)-3}{(x+5)}\,dx = \int 1-\frac{3}{x+5}\,dx = x-3\ln|x+5|+C$
4. $\int \frac{x-3}{x-8}\,dx = \int \frac{(x-8)+5}{(x-8)}\,dx = \int 1+\frac{5}{x-8}\,dx = x+5\ln|x-8|+C$
5. $\int \frac{2x-3}{x+2}\,dx = \int \frac{2(x+2)-7}{(x+2)}\,dx = \int 2-\frac{7}{x+2}\,dx = 2x-7\ln|x+2|+C$
6. $\int \frac{3x-1}{x-1}\,dx = \int \frac{3(x-1)+2}{(x-1)}\,dx = \int 3+\frac{2}{x-1}\,dx = 3x+2\ln|x-1|+C$
7. $\int \frac{4x+3}{2x-1}\,dx = \int \frac{2(2x-1)+5}{(2x-1)}\,dx = \int 2+\frac{5}{2x-1}\,dx = 2x+\frac{5}{2}\ln|2x-1|+C$
8. $\int \frac{3-x}{x-1}\,dx = \int \frac{-(x-1)+2}{x-1}\,dx = \int -1+\frac{2}{x-1}\,dx = -x+2\ln|x-1|+C$
9. $\int \frac{x+3}{2x-1}\,dx = \int \frac{\frac{1}{2}(2x-1)+\frac{7}{2}}{(2x-1)}\,dx = \int \frac{1}{2}+\frac{\frac{7}{2}}{2x-1}\,dx = \frac{1}{2}x+\frac{7}{4}\ln|2x-1|+C$
10. $\int \frac{3x+1}{2x-1}\,dx = \int \frac{\frac{3}{2}(2x-1)+\frac{5}{2}}{(2x-1)}\,dx = \int \frac{3}{2}+\frac{\frac{5}{2}}{2x-1}\,dx = \frac{3}{2}x+\frac{5}{4}\ln|2x-1|+C$