

## SATPREP

### Assignment : Integration by substitution

Integrate Following

1.  $\int \frac{x^2}{\sqrt{1-x^2}} dx$

2.  $\int \frac{x^2}{\sqrt{4+x^2}} dx$

3.  $\int \frac{3x-1}{x^2+1} dx$

4.  $\int \frac{(1-x^2)^{\frac{3}{2}}}{x^2} dx$

5.  $\int \frac{\sqrt{1-x^2}}{x} dx$

**Answers:**

(1)  $-\frac{1}{2}x\sqrt{1-x^2} + \frac{1}{2}\sin^{-1}(x) + C$  (2)  $\frac{1}{2}x\sqrt{x^2+4} - 2\ln\left|\frac{1}{2}\sqrt{x^2+4} + \frac{1}{2}x\right| + C$  (3)  $\frac{3}{2}\ln|x^2+1| - \tan^{-1}(x) + C$   
(4)  $\frac{-\sqrt{1-x^2}}{x} - \frac{3}{2}\sin^{-1}(x) - \frac{1}{2}x\sqrt{1-x^2} + C$  (5)  $\ln\left|\frac{1-\sqrt{1-x^2}}{x}\right| + \sqrt{1-x^2} + C$