

$$= \frac{1}{2} u + C$$

recall $u = \sqrt{4x^2 - 1}$

$$= \frac{1}{2} (4x^2 - 1)^{1/2} + C$$

or

$$\frac{1}{2} \sqrt{4x^2 - 1} + C$$

2.

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

$$= \int \sin^{-1} x \cdot (1-x^2)^{-1/2} dx$$

let $u = \sin^{-1} x$

let $du = (1-x^2)^{-1/2} dx$

$$= \int u \cdot du = \int \frac{u^2}{2} + C$$

$$= \frac{(\sin^{-1} x)^2}{2} + C$$

3.

$$\int (\tan x)^6 \sec^2 x dx$$

let $u = \tan x$

let $du = \sec^2 x dx$

$$\int u^6 du = \int \frac{u^7}{7} + C$$

$$= \int \frac{(\tan x)^7}{7} + C = \frac{(\tan x)^7}{7} + C$$

1.

$$\int \frac{2x}{\sqrt{4x^2 - 1}}$$

let $u = \sqrt{4x^2 - 1} = (4x^2 - 1)^{1/2}$

$$\frac{du}{dx} = \frac{1}{2} (4x^2 - 1)^{-1/2} \cdot 8x$$

$$\frac{du}{dx} = \frac{4x}{\sqrt{4x^2 - 1}}$$

$$\frac{du}{dx} = \frac{4x \cdot (4x^2 - 1)^{-1/2}}{1}$$

$$du = dx (4x \cdot (4x^2 - 1)^{-1/2})$$

$$dx (4x \cdot (4x^2 - 1)^{-1/2}) = du$$

$$dx = \frac{du}{4x \cdot (4x^2 - 1)^{-1/2}}$$

$$dx = \frac{(4x^2 - 1)^{1/2}}{4x} du$$

$$\int \frac{2x}{\sqrt{4x^2 - 1}} = \frac{2}{1} \int \frac{x}{u} dx = 2 \int$$

$$= 2 \int \frac{x}{u} \times \frac{(4x^2 - 1)^{1/2}}{4x} du$$

$$= 2 \int \frac{x}{(4x^2 - 1)^{1/2}} \times \frac{(4x^2 - 1)^{1/2}}{4x} du$$

$$= \frac{2}{4} \int du = \frac{1}{2} \int du$$