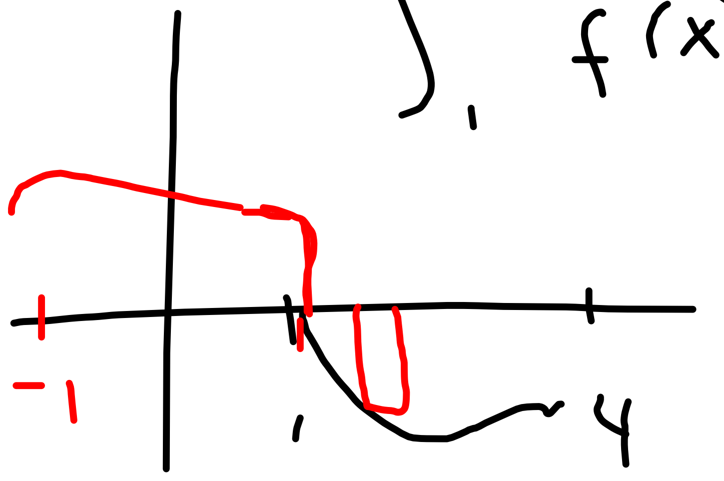
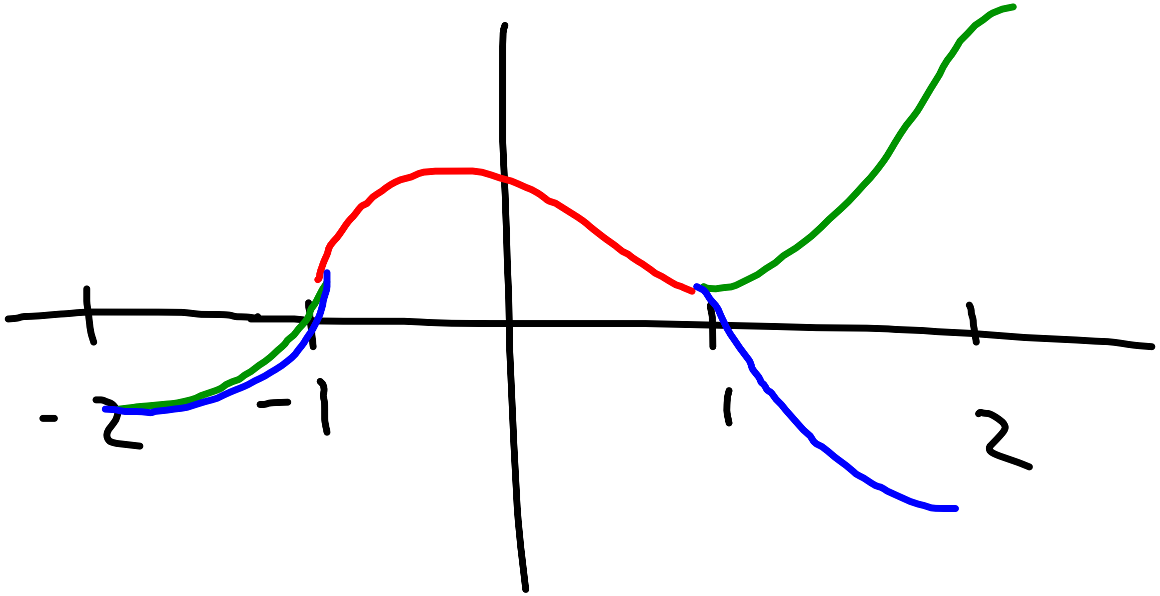
$$\int_1^4 f(x)\,dx$$



$$\int_4^1 f(x)\,dx$$


-2
-1
1
2

$$\int (1 - x^3)\, dx$$

$$\int c \; dx$$

$$\int 1 \, dx - \int x^3 \, dx$$

$$x + C_1 - \frac{x^4}{4} + C_2$$

$$x - \frac{x^4}{4} + C$$

$$\int \frac{4}{3}\sqrt[3]{t}\,dt$$

$$\frac{4}{3}\int t^{\frac{1}{3}}\,dt$$

$$\cancel{\frac{4}{3}} \cdot \frac{t^{\frac{4}{3}}}{\cancel{\frac{4}{3}}} \qquad \frac{4}{3}\cdot\frac{3}{4}t^{\frac{4}{3}}$$

$$\int 2\sqrt[3]{t}\,dt$$

$$2\left(\frac{3}{4}t^{\frac{4}{3}}\right) = \frac{3}{2}t^{\frac{4}{3}}$$

$$t^{\frac{4}{3}} + C$$

$$\int \sqrt{4x-1}\, dx$$

$$\frac{1}{4}\int u^{\frac{1}{2}}\, \underbrace{4 \cdot \quad dx}$$

$$\frac{1}{4}\int u^{\frac{1}{2}}\, du$$

$$\frac{1}{4}\left[\frac{2}{3}u^{\frac{3}{2}}\right] + C$$

$$\frac{1}{6}u^{\frac{3}{2}} + C$$

$$\frac{1}{6}(4x-1)^{\frac{3}{2}} + C$$

Let $u = 4x-1$

$$\frac{du}{dx} = 4$$

$$du = 4\,dx$$

$$\int \sqrt{4x-1}\,dx$$

$$\int \sqrt{u}\cdot\frac{1}{4}\,du$$

$$\frac{1}{4}\int u^{\frac{1}{2}}\,du$$

Let $u = 4x-1$

$$\frac{du}{dx} = 4$$

$$dx = \frac{1}{4}\,du$$

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$$\frac{du}{dx} = 4$$

$$\frac{du}{4} = \frac{4\,dx}{4}$$

$$\int \sqrt{4x-1}\,dx$$

Let $u = 4x-1$

$du = 4\,dx$

$$\frac{1}{4}\int \sqrt{4x-1}\;4\,dx$$

$$\frac{1}{4}\int u^{\frac{1}{2}}\,du$$

$$\int \sin 3x \, dx$$

Let $u = 3x$

$$\frac{du}{dx} = 3$$

$$du = 3dx$$

$$\frac{1}{3}\int \sin 3x \, \underbrace{3dx}$$

$$\frac{1}{3}\int \sin u \, du$$

$$\frac{1}{3}(-\cos u) + C$$

$$\frac{1}{3}(-\cos 3x) + C$$

$$\frac{-\cos 3x}{3} + C$$

$$\int \underbrace{\sin 3x}_{\downarrow} \, \underbrace{dx}_{\downarrow}$$

Let $u = 3x$

$du = 3\,dx$

$dx = \frac{1}{3}\,du$

$$\int \sin u \cdot \frac{1}{3}\,du$$

$$\frac{1}{3}\int \sin u\,du$$

$$\frac{1}{3}(-\cos u) + C$$

$$\frac{1}{3}\int \underbrace{\sin 3x}\, \underbrace{3\,dx}$$

$$\frac{1}{3}\int \sin u \quad du$$

$$\int \frac{9r^2}{\sqrt{1-r^3}}\,dr$$

Let $u = 1 - r^3$

$$\frac{du}{dr} = -3r^2$$

$$du = -3r^2\,dr$$

$$dr = \frac{1}{-3r^2}\,du$$

$$u = 1 - r^3$$

$$\int -3 \cdot \frac{1}{\sqrt{1-r^3}} \cdot -3r^2\,dr$$

$$-3\int u^{-\frac{1}{2}}\,du$$

$$\int \frac{9r^2}{\sqrt{1-r^3}}\,dr$$

$$\int \left(\frac{9r^2}{\sqrt{u}}\right) \cdot \left(\frac{1}{-3r^2}\right) du$$

$$\int \frac{-3}{\sqrt{u}}\,du$$

$$-3\int u^{-\frac{1}{2}}\,du$$

$$-3\left(2u^{\frac{1}{2}}\right) + C$$

$$-6\sqrt{1-r^3} + C$$