

Ex 5

$$a) \int y'(x) y(x) dx = \int y(x) dy(x) = \frac{y^2(x)}{2} + C$$

$$b) \int u'(x) (u(x))^4 dx = \int (u(x))^4 du(x) = \frac{u^5(x)}{5} + C$$

$$c) \int u'(x) (u(x))^n dx = \int (u(x))^n du(x) = \frac{u^{n+1}(x)}{n+1} + C$$

$$d) \int \frac{f'(x)}{f(x)} dx = \int \frac{d(f(x))}{f(x)} = \ln |f(x)| + C$$

$$e) \int \frac{y'(s)}{(y(s))^2} ds = \int \frac{dy(s)}{(y(s))^2} = -\frac{1}{y(s)} + C$$

$$f) \int \frac{v'(x)}{\sqrt{v(x)}} dx = \int (v(x))^{-\frac{1}{2}} dv(x) = 2(v(x))^{\frac{1}{2}} + C$$

$$g) \int \frac{u'(x)}{(u(x))^7} dx = \int (u(x))^{-7} du(x) = -\frac{1}{6} (u(x))^{-6} + C$$

$$h) \int \frac{v'(t)}{1+(v(t))^2} dt = \int \frac{dv(t)}{1+(v(t))^2} = \arctan v(t) + C$$

$$i) \int y'(t) e^{y(t)} dt = \int e^{y(t)} dy(t) = e^{y(t)} + C$$

$$j) \int u'(x) \sin u(x) dx = \int \sin u(x) du(x) = -\cos u(x) + C$$

$$k) \int \frac{y'(x)}{\sqrt{1-y(x)^2}} dx = \int \frac{dy(x)}{\sqrt{1-y(x)^2}} = \arcsin y(x) + C$$

$$l) \int y'(x) (1 + \tan^2 y(x)) dx = \int (1 + \tan^2 y(x)) dy(x) = \tan y(x) + C$$