

Answers to Assignment 00

- > `int(cos(t)^2,t);`

$$\frac{1}{2} \cos(t) \sin(t) + \frac{1}{2} t$$
- > `int(sin(x)^3,x);simplify(%);`

$$-\frac{1}{3} \sin(x)^2 \cos(x) - \frac{2}{3} \cos(x)$$

$$-\cos(x) + \frac{1}{3} \cos(x)^3$$
- > `int(sqrt(1-cos(t)),t=0..2*Pi);`

$$4\sqrt{2}$$
- > `int(x*arctan(x),x);`

$$\frac{1}{2} x^2 \arctan(x) - \frac{1}{2} x + \frac{1}{2} \arctan(x)$$
- > `int(1/sqrt(4*x-x^2),x);`

$$\arcsin\left(-1 + \frac{1}{2} x\right)$$
- > `int(sqrt(x^2+1),x);`

$$\frac{1}{2} x \sqrt{x^2 + 1} + \frac{1}{2} \operatorname{arcsinh}(x) \left[= \frac{1}{2} x \sqrt{x^2 + 1} + \frac{1}{2} \ln \left| x + \sqrt{x^2 + 1} \right| \right]$$
- > `int(x^3/sqrt(x^2+1),x);`

$$\frac{1}{3} x^2 \sqrt{x^2 + 1} - \frac{2}{3} \sqrt{x^2 + 1} \left[= x^2 \sqrt{x^2 + 1} - \frac{2}{3} (x^2 + 1)^{3/2} \right]$$
- > `int(1/(x^2-x-6),x);`

$$-\frac{1}{5} \ln(x + 2) + \frac{1}{5} \ln(x - 3)$$
- > `int(sqrt(1+(x-1/(4*x))^2),x=2..4);`

$$6 + \frac{1}{4} \ln(2)$$
- > `plot([x^2-4*x,2*x],x=-2..8);int(2*x-(x^2-4*x),x=0..6);`

$$36$$
- > `int(Pi*x,x=0..9);int(2*Pi*x^(3/2),x=0..9);`

$$\frac{81}{2} \pi$$

$$\frac{972}{5} \pi$$
- > `limit((x-arctan(x))/x^3,x=0);`

$$\frac{1}{3}$$