

# Review

- Evaluate the integral.

1.  $\int_1^5 \frac{dt}{(t-4)^2}$

2.  $\int_0^1 v^2 \cos v^3 dv$

3.  $\int_0^4 |\sqrt{x} - 1| dx$

4.  $\int_0^4 |x^3 - 5x^2 + 6x| dx$

- If  $f'$  is continuous on  $[a, b]$ , show that

$$2 \int_a^b f(x)f'(x) dx = [f(b)]^2 - [f(a)]^2$$

- Find the derivative of

$$g(x) = \int_0^{x^4} \cos(t^2) dt$$

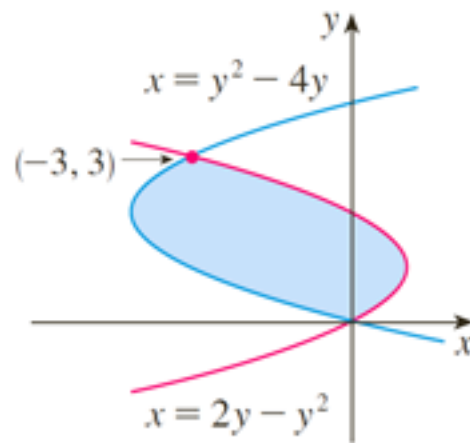
- If  $f$  is a continuous function such that

$$\int_0^x f(t) dt = x \sin x + \int_0^x \frac{f(t)}{1+t^2} dt$$

for all  $x$ , find an explicit formula for  $f(x)$ .

- Find  $\lim_{h \rightarrow 0} \frac{1}{h} \int_2^{2+h} \sqrt{1+t^3} dt$ .

- Find the area of the shaded region.



- Find the volume of the solid obtained by rotating the region bounded by the given curves around the specified line. Sketch the region, the solid, and a typical disk or washer.

$$y^2 = x, x = 2y; \text{ about the } y\text{-axis}$$

- Use cylindrical shells to find the volume of the solid.

A right circular cone with height  $h$  and base radius  $r$ .