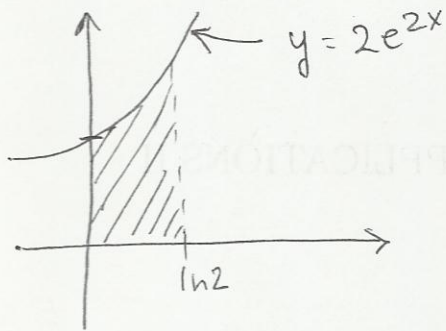


16 $f(x) = 2e^{2x}$ $[0, \ln 2]$



Find the area of the shaded region.

$$= \int_0^{\ln 2} 2e^{2x} dx$$

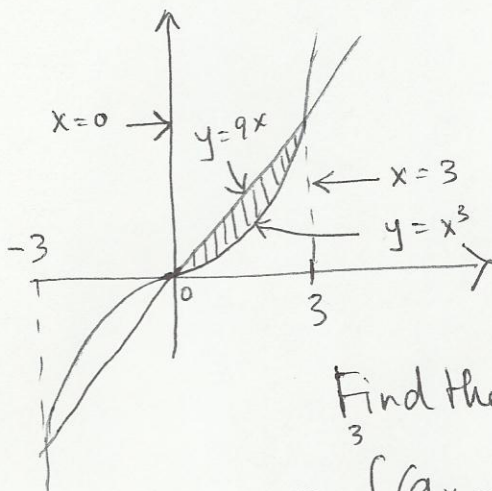
$$= 2 \int_0^{\ln 2} e^{2x} dx = 2 \frac{e^{2x}}{2} \Big|_0^{\ln 2}$$

$$= e^{2 \ln 2} - e^0 \quad [\text{Recap } x \ln y = \ln y^x]$$

$$= e^{\ln 4} - 1 \quad [\text{Recap } e^{\ln x} = x]$$

$$= 4 - 1 = \boxed{3}$$

17 $y = 9x$, $y = x^3$, $x = 0$, $x = 3$



Where do $y = 9x$ and $y = x^3$ intersect?

$$\begin{aligned} 9x &= x^3 \\ \Rightarrow x^3 - 9x &= 0 \\ \Rightarrow x(x^2 - 9) &= 0 \\ \Rightarrow x(x-3)(x+3) &= 0 \\ x &= 0, 3, -3 \end{aligned}$$

Find the area of the shaded region

$$= \int_0^3 (9x - x^3) dx = \int_0^3 9x dx - \int_0^3 x^3 dx$$

$$= \frac{9x^2}{2} \Big|_0^3 - \frac{x^4}{4} \Big|_0^3 = \left(\frac{81}{2} - \frac{81}{4} \right)$$

$$= \frac{81}{4} = \boxed{20.25}$$