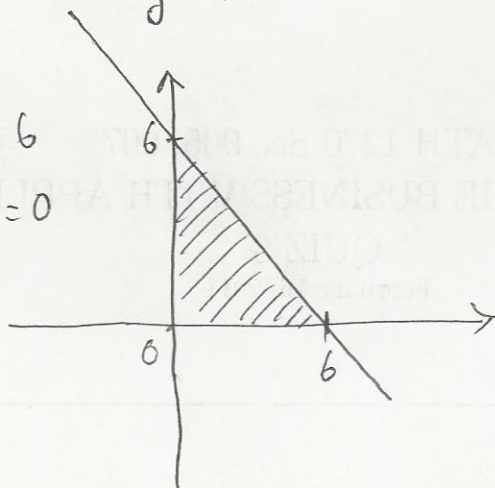


$$\frac{12}{\int_0^6 (6-x) dx}$$

$y = 6 - x$  is a straight line.

$$y = 6 - 6 = 0 \text{ when } x = 6$$

$$y = 6 - 0 = 6 \text{ when } x = 0$$



Area of a triangle.

$$= \frac{1}{2} \times \text{base} \times \text{perpendicular height.}$$

$$\text{Find the area of the shaded region} = \frac{1}{2} \times 6 \times 6 = \boxed{18}$$

$$\frac{13}{\int_0^1 \sqrt{t^5+4t} (5t^4+4) dt}$$

$$\text{Let } u = t^5 + 4t$$

$$\frac{du}{dt} = 5t^4 + 4 \Rightarrow du = (5t^4 + 4) dt$$

$$\text{When } t = 0, u = 0$$

$$t = 1, u = 5$$

$$= \int_0^5 \sqrt{u} du$$

$$= \frac{u^{\frac{3}{2}}}{\frac{3}{2}} \Big|_0^5$$

$$= \frac{2}{3} \cdot 5^{3/2} - \frac{2}{3} \cdot 0^{3/2}$$

$$= \boxed{\frac{2 \cdot 5^{3/2}}{3}}$$