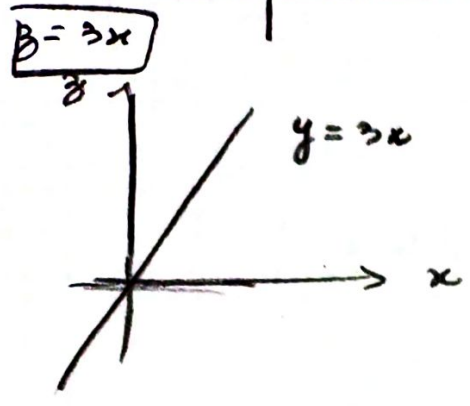
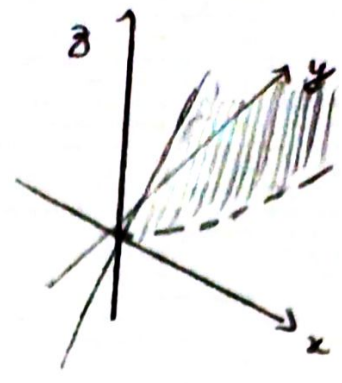
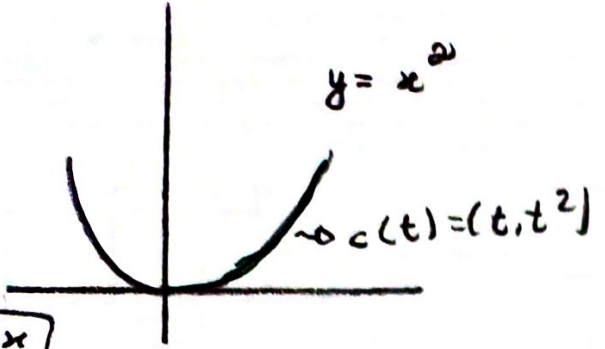


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$$\underline{\text{Area}} = \int_c f \, d\mathbf{s}$$

$$= \int_c f(x(t), y(t)) \cdot \|\mathbf{x}'(t)\| \, dt$$

$$f(x, y) = 3x \Rightarrow f(x(t), y(t)) = 3t$$

$$\mathbf{x}(t) = t\mathbf{i} + t^2\mathbf{j}$$

$$\mathbf{x}'(t) = \mathbf{i} + 2t\mathbf{j}$$

$$\int_c 3t \cdot \sqrt{1+4t^2} \, dt //$$

$$\|\mathbf{x}'(t)\|$$

$$\sqrt{1^2 + (2t)^2}$$

$$= \sqrt{1+4t^2} //$$

$$\int_0^2 3t \sqrt{1+4t^2} \, dt$$

$$3 \int t \sqrt{1+4t^2} \, dt$$

$$u = 1+4t^2$$

$$3 \int \frac{1}{8} \sqrt{u} \, du$$

$$3 \cdot \frac{1}{8} \int \sqrt{u} \, du$$

$$= \frac{3}{8} \int u^{1/2} \, du \Rightarrow \frac{3}{8} \cdot \frac{2u\sqrt{u}}{3}$$

$$\Rightarrow \frac{3}{8} \cdot 2(1+4t^2) \sqrt{1+4t^2}$$

$$\Rightarrow \frac{1}{4} (1+4t^2) \sqrt{1+4t^2} \Big]_0^2$$

$$\Rightarrow \frac{17\sqrt{17} - 1}{4} //$$