

Miscellaneous exercises

a) $r=-1$ b) $r=1.5$ c) $r=0$

1.

$$y = \frac{x^2}{a}$$

$$y = \sqrt{ax}$$

$$\sqrt{ax} = \frac{x^2}{a}$$

$$ax = \frac{x^4}{a^2}$$

$$x = \frac{x^4}{a^3}$$

$$a = x$$

$$\int_0^a a^{\frac{1}{2}} x^{\frac{1}{2}} dx - \int_0^a \frac{x^2}{a} dx$$

$$\left[\frac{\sqrt{a}}{\frac{3}{2}} x^{\frac{3}{2}} - \frac{1}{3a} x^3 \right]_0^a = \frac{\sqrt{a} \sqrt{a}^3}{\frac{3}{2}} - \frac{1}{3a} a^3$$

$$= 2 \frac{a^3}{3} a - \frac{a^3}{3a} = \frac{2a^3 - a^3}{3a}$$

$$= \frac{2}{3} a^2 - \frac{a^2}{3} = a^2 \left(\frac{2}{3} - \frac{1}{3} \right) = \frac{1}{3} a^2$$

Answer: c

2. b

Volume Aufgabe

1.

$$\int_0^L \int_0^b h dy dx = \int_0^L h b dx = h L b$$

2.

$$d = f(x, y)$$

$$\int_0^{2\pi} \int_0^r r d dr d\theta$$

$$\int_0^d \int_0^{2\pi} \frac{d}{2} r^2 d\theta$$

$$\frac{z\theta r^2}{2}$$

$$\frac{d2\pi r^2}{2} = d\pi r^2$$