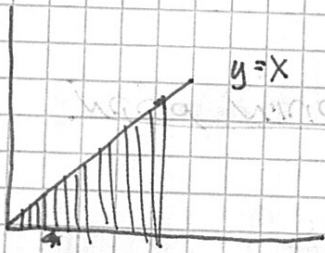


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218 ת"ר וי"ט תמוז ה'תש"ע

תרגיל 1:

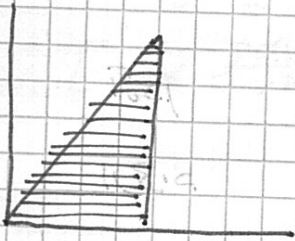


$$\int_0^4 x dx = 8$$

הקטנה מתחילה:

אינטגרל פשוט:

$$\int_{x=0}^4 \int_{y=0}^{y=x} dy dx = \int_0^4 x dx = 8$$



עכשיו פשוט פשוט:

$$\int_{y=0}^4 \int_{x=y}^{x=4} dx dy = \int_0^4 (4-y) dy = [4y - \frac{1}{2}y^2]_0^4 = 8$$

$dm \rightarrow dq$

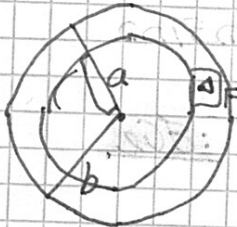
תוצאה:

$\lambda dl / \sigma ds / \rho dv =$
 תוצאה / תוצאה / תוצאה

$$\lambda = \frac{5}{(x+1)^2}$$

$$Q = \int_0^5 \lambda dx = \int_0^5 \left(\frac{5}{(x+1)^2} \right) dx$$

$$\left[\frac{c}{m^2} \right] \leftarrow \sigma = \frac{c}{r \sin \theta}$$



התוצאה = תוצאה = תוצאה

$$ds = r dr d\theta$$

$$Q = \int_0^{2\pi} \int_a^b \frac{c}{r \sin \theta} r dr d\theta$$

$$= c(b-a) \int_0^{2\pi} \frac{d\theta}{\sin \theta}$$



$$\rho = \frac{c}{r \sin \theta}$$

קואורדינטות קרוניות: H קרונית

$$[c] = \left[\frac{g}{m^2} \right]$$

$$Q = \int_0^h \int_0^{2\pi} \int_a^b \frac{c}{r \sin \theta} r dr d\theta dz$$

קואורדינטות קרוניות

$$dq = \rho dx dy dz = \rho r dr d\theta dz = \rho r^2 \sin \theta dr d\theta dz$$

$$0 \leq \theta \leq \pi$$

$$0 \leq \varphi \leq 2\pi$$

הנרמל: $\rho = \frac{1}{\sqrt{x^2 + y^2}}$

$$x = r \sin \theta \cos \varphi$$

$$y = r \sin \theta \sin \varphi$$

$$z = r \cos \theta$$

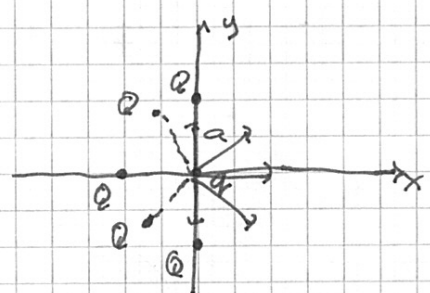
$$\rho = \frac{1}{\sqrt{r^2 \sin^2 \theta \cos^2 \varphi + r^2 \sin^2 \theta \sin^2 \varphi}} = \frac{1}{r \sin \theta}$$

$$Q = \int_0^h \int_0^{2\pi} \int_0^b \frac{1}{r \sin \theta} r^2 \sin \theta dr d\theta d\varphi = \frac{1}{2} b^2 2\pi^2 = \pi^2 b^2$$

כיוון \vec{r} כיוון \vec{r} כיוון \vec{r} כיוון \vec{r}

$$\vec{F} = \frac{kq_1q_2}{r^2} \hat{r}$$

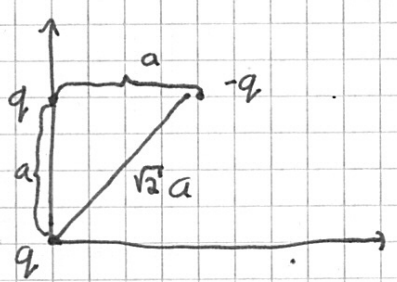
כוח תולדות



$$\vec{F}_q = \frac{kQq}{a^2} (-\hat{y}) + \frac{kQq}{a^2} (\hat{y}) + \frac{kQq}{a^2} \left(\cos\left(\frac{\pi}{4}\right) \hat{x} + \sin\left(\frac{\pi}{4}\right) \hat{y} \right)$$

$$+ \frac{kQq}{a^2} \left(\cos\left(\frac{\pi}{4}\right) \hat{x} + \sin\left(\frac{\pi}{4}\right) \hat{y} \right)$$

\vec{F}_u



$$F_{-q} = \frac{k(-q)q}{a^2} \hat{x} + \frac{k(-q)q}{(\sqrt{2}a)^2} \left(\cos\left(\frac{\pi}{4}\right) \hat{x} + \sin\left(\frac{\pi}{4}\right) \hat{y} \right)$$