



SON TESLİM TARİHİ: Çarşamba 19 Kasım 2014 saat 10:00'e kadar.

$$f(x, y) = y - x, \quad g(x, y) = \sqrt{y - x}.$$

Egzersiz 11 (Functions of Several Variables).

- [4p] What is the domain of f ?
- [4p] What is the range of f ?
- [4p] What are the level curves of f ?
- [4p] What is the boundary of the domain of f ?
- [4p] Is the domain of f an open region, a closed region, or neither?
- [5p] Is the domain of f bounded or unbounded?

Egzersiz 12 (Functions of Several Variables).

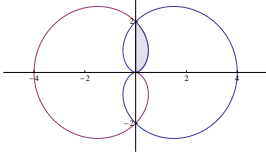
- [4p] What is the domain of g ?
- [4p] What is the range of g ?
- [4p] What are the level curves of g ?
- [4p] What is the boundary of the domain of g ?
- [4p] Is the domain of g an open region, a closed region, or neither?
- [5p] Is the domain of g bounded or unbounded?

Egzersiz 13 (Graphing a Function).

- [30p] Sketch the surface $z = h(x, y) = 4x^2 + y^2$.
- [20p] Plot the level curves $h(x, y) = 0$, $h(x, y) = 1$, $h(x, y) = 4$ and $h(x, y) = 9$ in the domain of h .

Ödev 4'ün çözümleri

9. First, $2(1 + \cos \theta) = 2(1 - \cos \theta) \implies \cos \theta = 0 \implies \theta = \frac{\pi}{2}$ or $\theta = \frac{3\pi}{2}$. We can see from the graph that there is also a point of intersection at the origin.



By symmetry, $A = 4 \left[\frac{1}{2} \int_0^{\frac{\pi}{2}} ((2(1 - \cos \theta))^2) d\theta \right] = 8 \int_0^{\frac{\pi}{2}} 1 - 2 \cos \theta + \cos^2 \theta d\theta = 8 \int_0^{\frac{\pi}{2}} 1 - 2 \cos \theta + \frac{1}{2} + \frac{1}{2} \cos 2\theta d\theta = 8 \left[\frac{3}{2} \theta - 2 \sin \theta + \frac{1}{4} \sin 2\theta \right]_0^{\frac{\pi}{2}} = 6\pi - 16$.

10. First $\frac{dx}{d\theta} = \frac{e^\theta}{\sqrt{2}}$. Therefore $L = \int_0^\pi \sqrt{r^2 + \left(\frac{dx}{d\theta}\right)^2} d\theta = \int_0^\pi \sqrt{\left(\frac{e^\theta}{\sqrt{2}}\right)^2 + \left(\frac{e^\theta}{\sqrt{2}}\right)^2} d\theta = \int_0^\pi \sqrt{e^{2\theta}} d\theta = \int_0^\pi e^\theta d\theta = [e^\theta]_0^\pi = e^\pi - 1$.

*** Ara sınav: 20 Kasım 2014, saat 9:30-10:30. ***