

Find the domain of the following functions

$$(\alpha) \quad f(x, y) = \ln(xy)$$

$$(\beta) \quad f(x, y) = \ln(x) \cdot \ln(y)$$

$$(\gamma) \quad f(x, y) = \frac{\sqrt{x}}{y}$$

$$(\delta) \quad f(x, y) = \frac{x^2}{y}$$

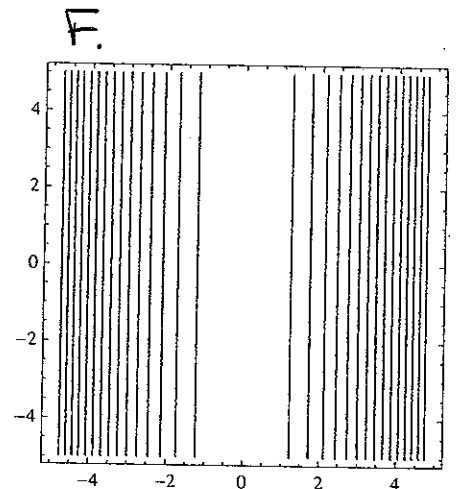
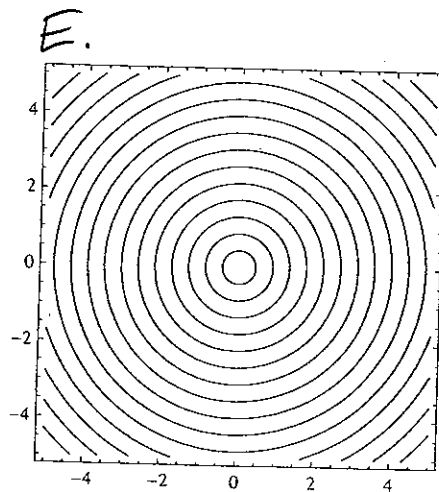
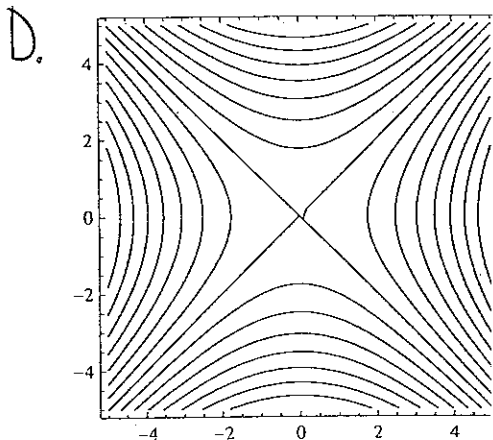
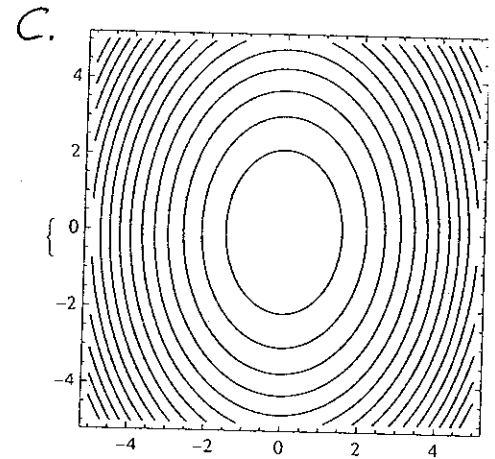
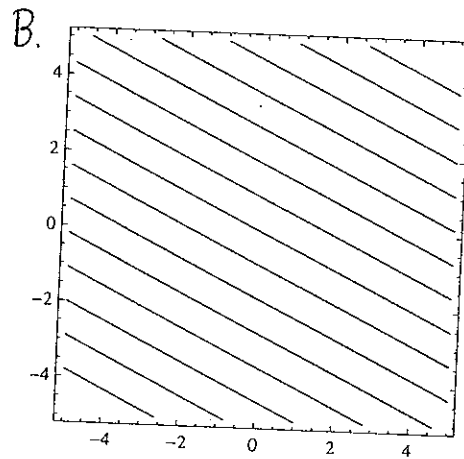
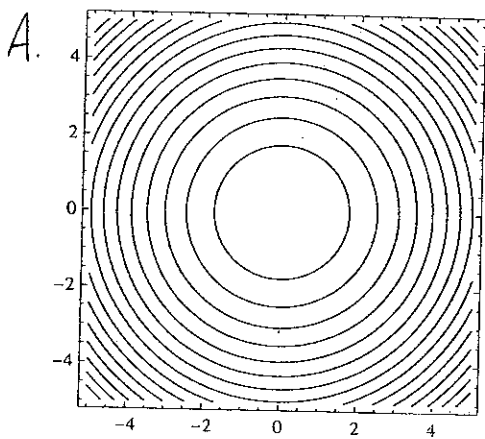
$$(\varepsilon) \quad f(x, y) = \sqrt{x+y}$$

$$(\zeta) \quad f(x, y) = \sqrt{y \cdot e^x}$$

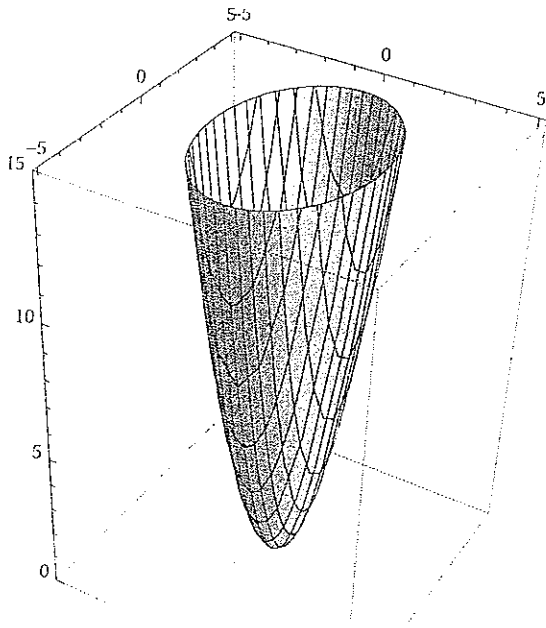
$$(\eta) \quad f(x, y) = \frac{\sin(y)}{x}$$

- Match the Equations with the contour plots (below) with the 3D-graphs (next 2 pages). Not all 3D-graph/Equations pairs have corresponding contour plots.
- What Are the names of these surfaces?
- Which Are cylinders?

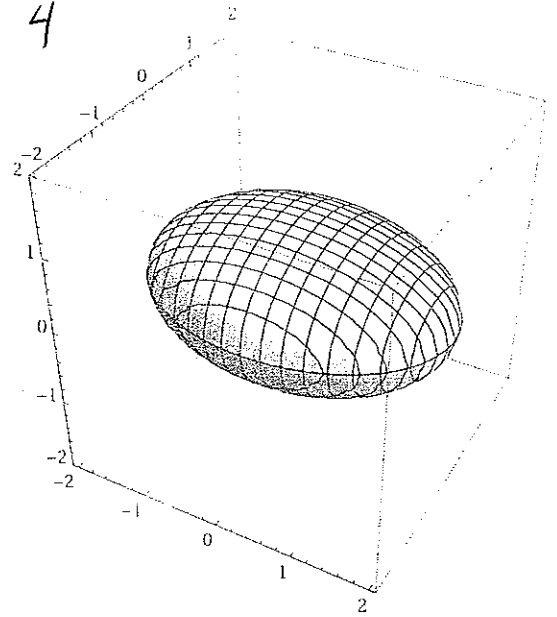
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|----------------------|--------------------------|--|
| a. $z = x^2 - y^2$ | e. $z = x^2$ | i. $z^2 + 5x^2 = 1$ |
| b. $z = x^2 + y^2$ | f. $z^2 = x^2 + y^2 - 1$ | j. $z^2 = 1 - \frac{x^2}{4} - \frac{y^2}{2}$ |
| c. $z^2 = x^2 + y^2$ | g. $z^2 = x^2 + y^2 + 1$ | k. $z = 2x^2 + y^2$ |
| d. $z^2 + x^2 = 1$ | h. $z = x + 2y$ | |



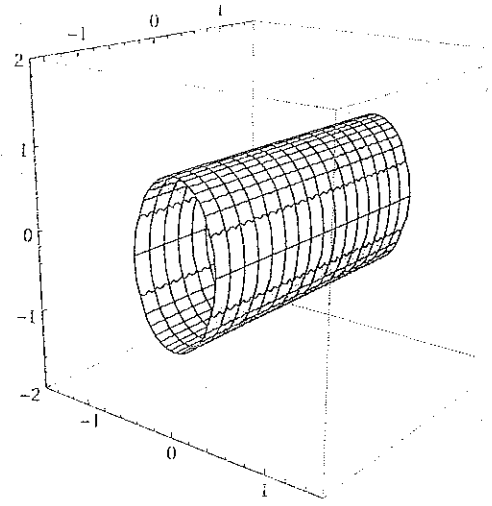
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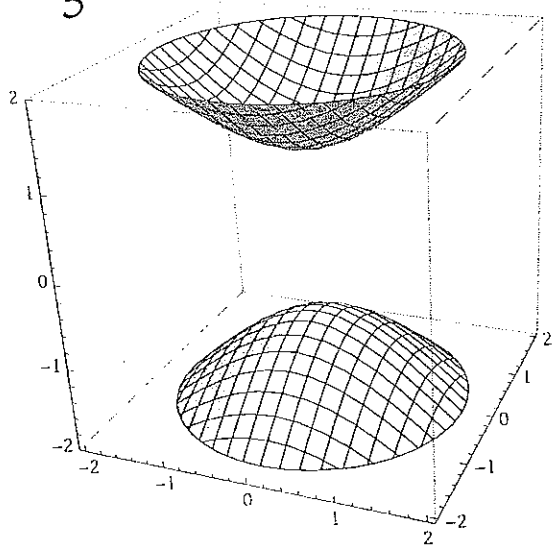
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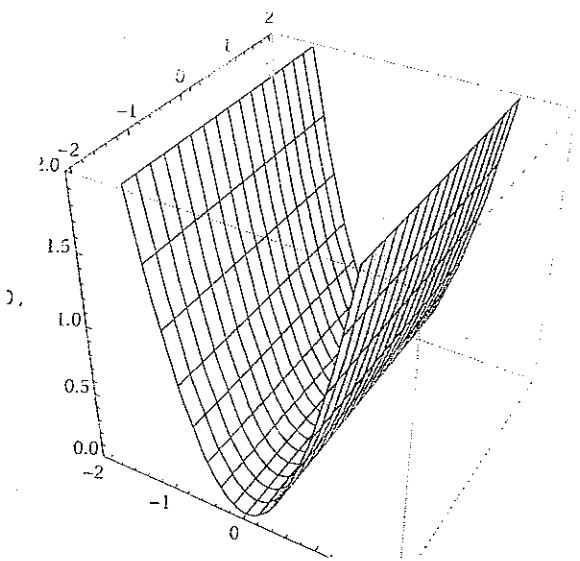
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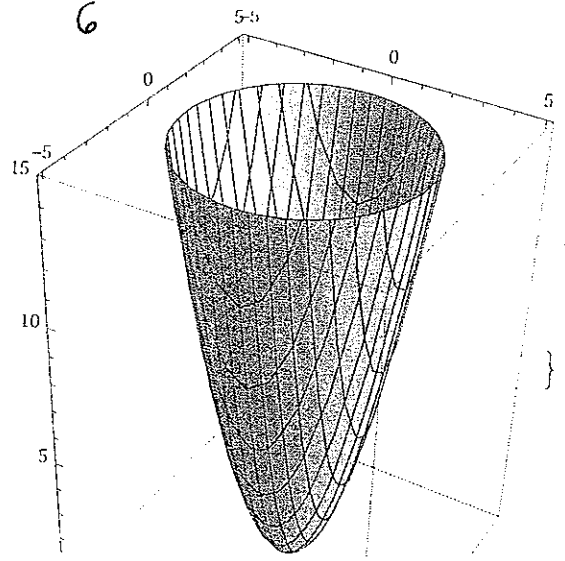
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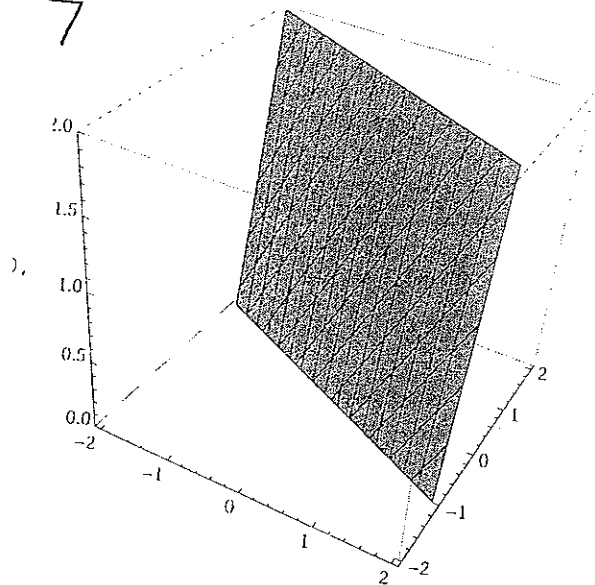
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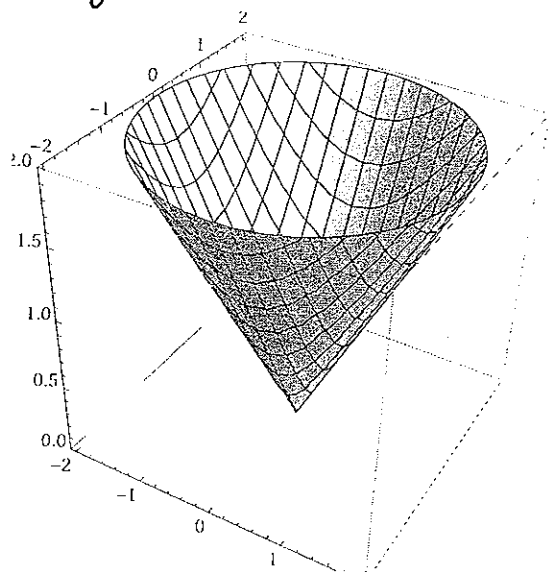
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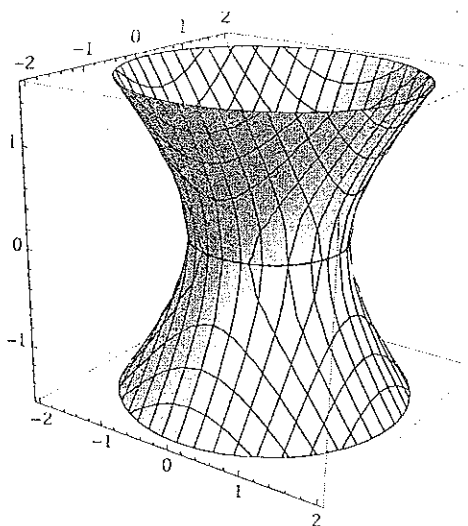
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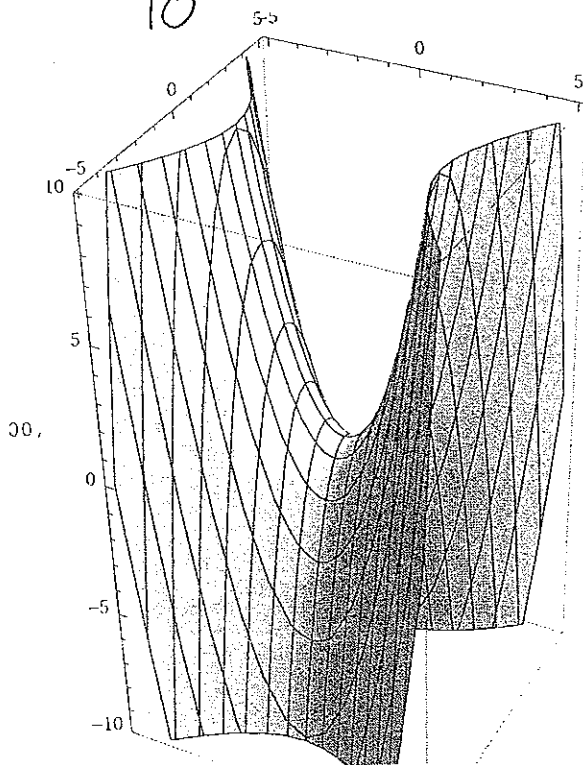
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