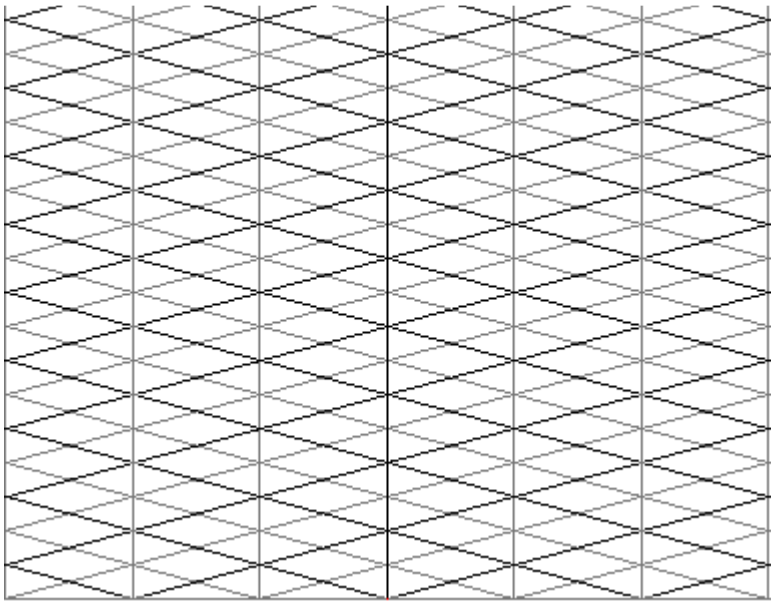
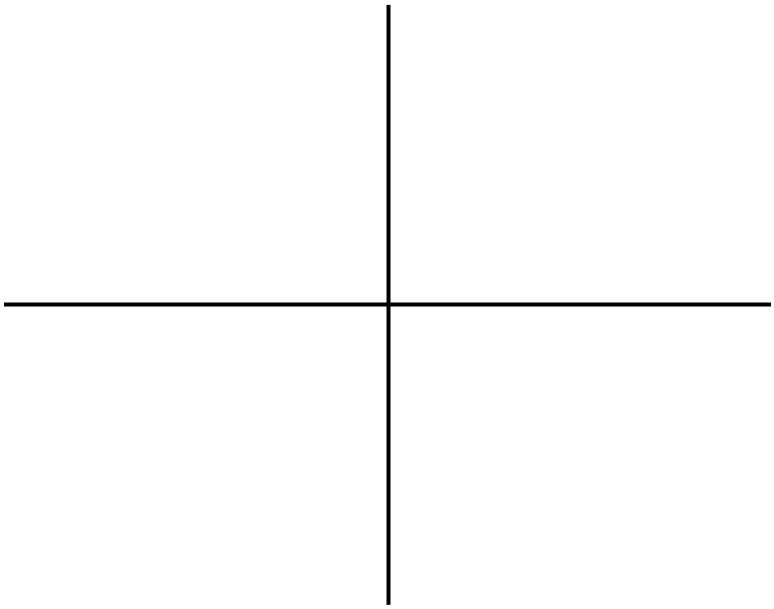
SI Session: Nov. 17, 2008
Mondays: 1:30 PM – 3:00 PM & 4:50 PM – 6:20 PM
Wednesdays: 1:30 PM – 3:00 PM & 4:50 PM – 6:20 PM
Room 1239 SNAD(Wed. early rm. 1121)

Prof. Stockton : Calculus III
Fall 2008
SI Leader : Neil Jody

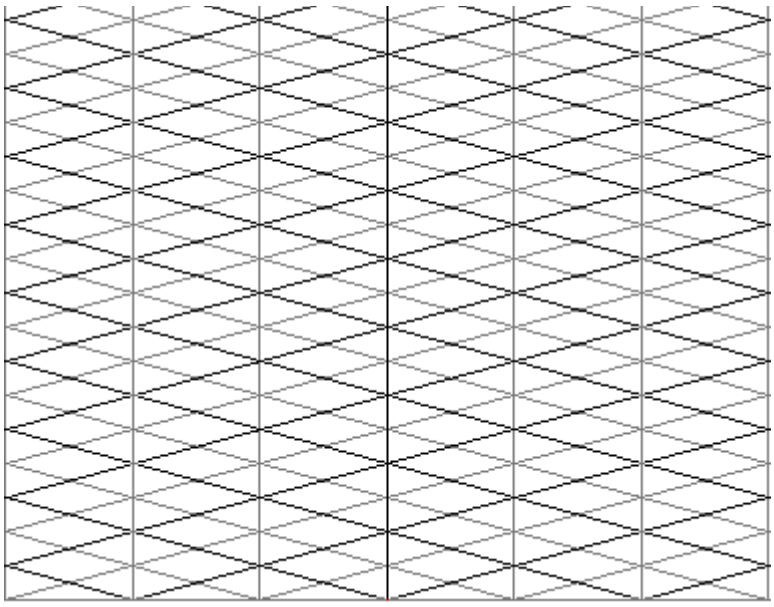
[1] Sketch the solid whose volume is given by the iterated integral and rewrite the integral using the indicated order of integration.

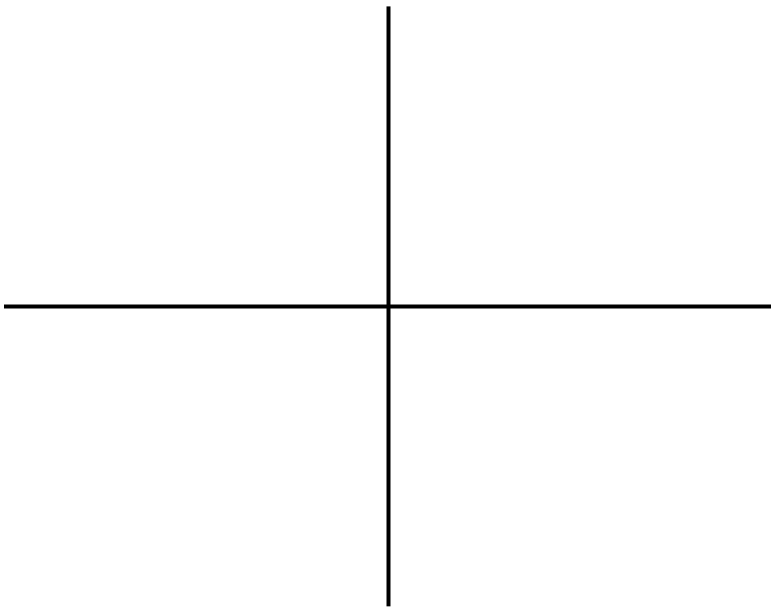
(a) $\int_0^3 \int_0^{\sqrt{9-x^2}} \int_0^{6-x-y} dz\, dy\, dx$; rewrite using the order $dz\, dx\, dy$.



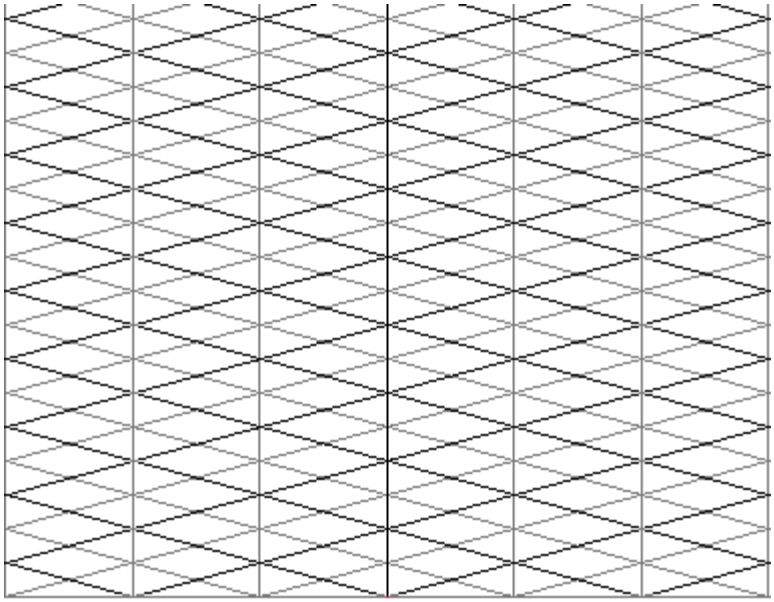


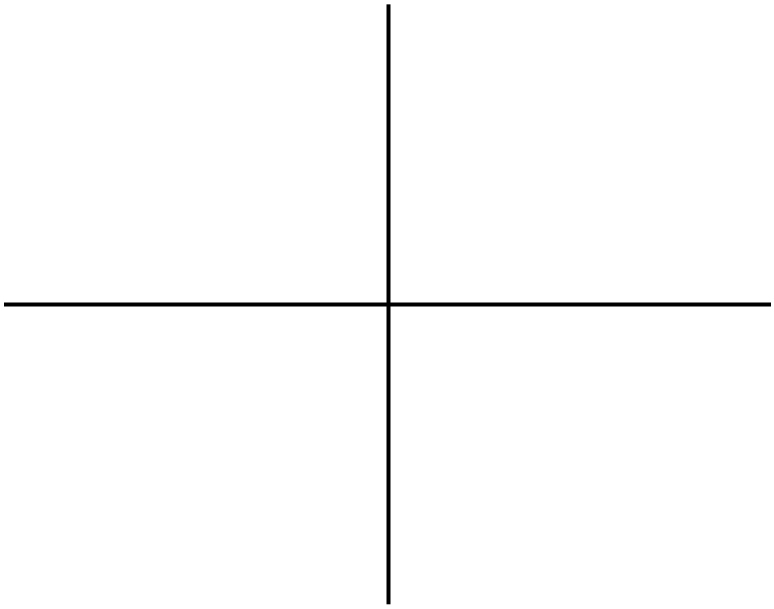
(b) $\int_0^2 \int_{2x}^4 \int_0^{\sqrt{y^2-4x^2}} dz\, dy\, dx$; rewrite using the order $dx\, dy\, dz$.



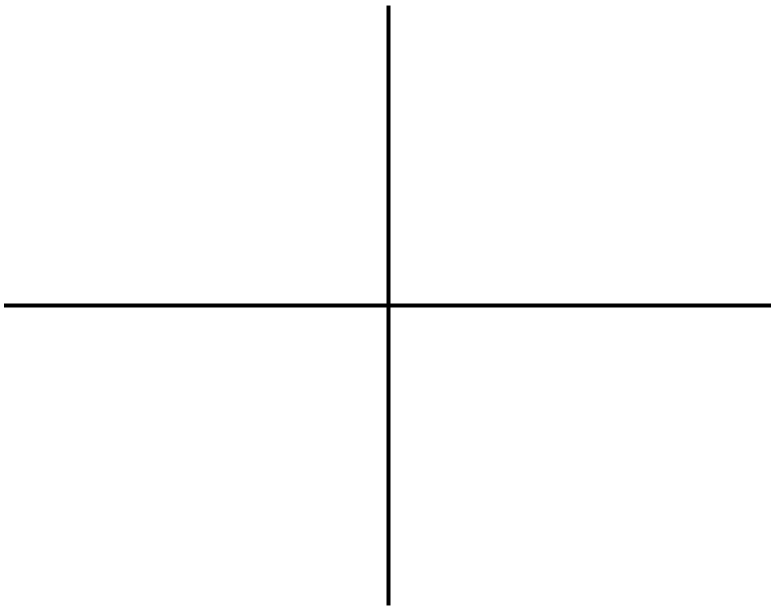


[2] Express as an triple iterated integral the volume of the solid in the first octant bounded by the coordinate axes and the graphs of $z + x^2 = 4$ and $y + z = 4$.





[3] A thin plate has the shape of the region in the xy-plane bounded by the graphs of $y = 2, y = -x + 2, y = \frac{1}{2}x - 1$. If the density at (x,y) is given by $\delta(x, y) = x^2 + y^2 + 1$, set up an iterated integral which gives the mass of the plate.



[4] Find an equation in cylindrical coordinates for the equation given in rectangular coordinates.

(a) $x = 4$

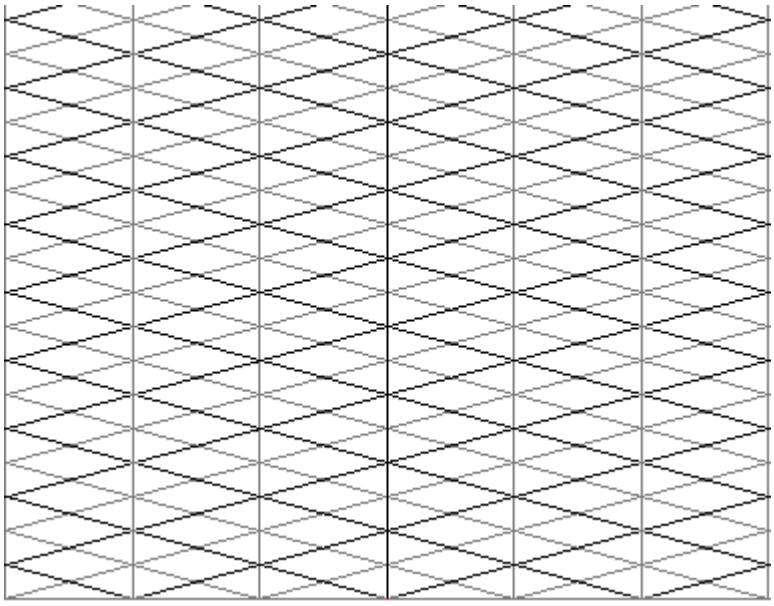
(b) $z = x^2 + y^2 - 2$

(c) $x^2 + y^2 = 8x$

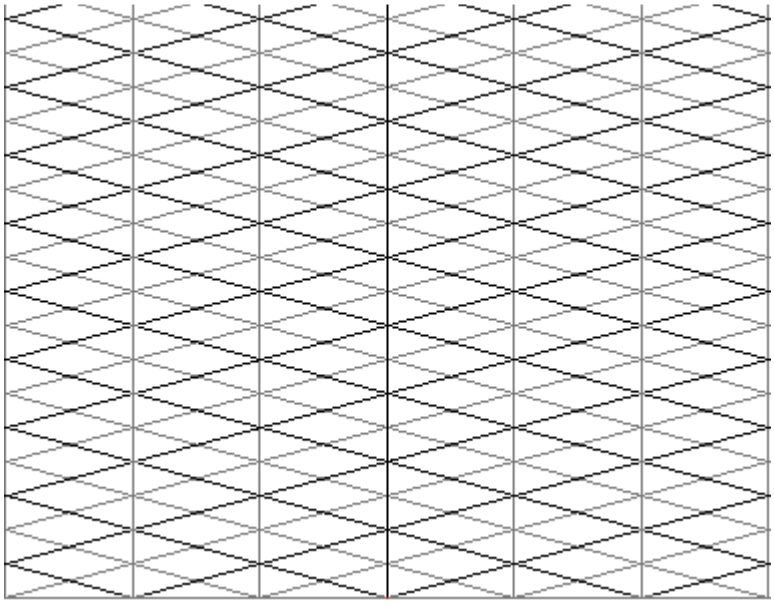
(d) $x^2 + y^2 + z^2 - 3z = 0$

[5] Find an equation in rectangular coordinates for the equation given in cylindrical coordinates, and sketch its graph.

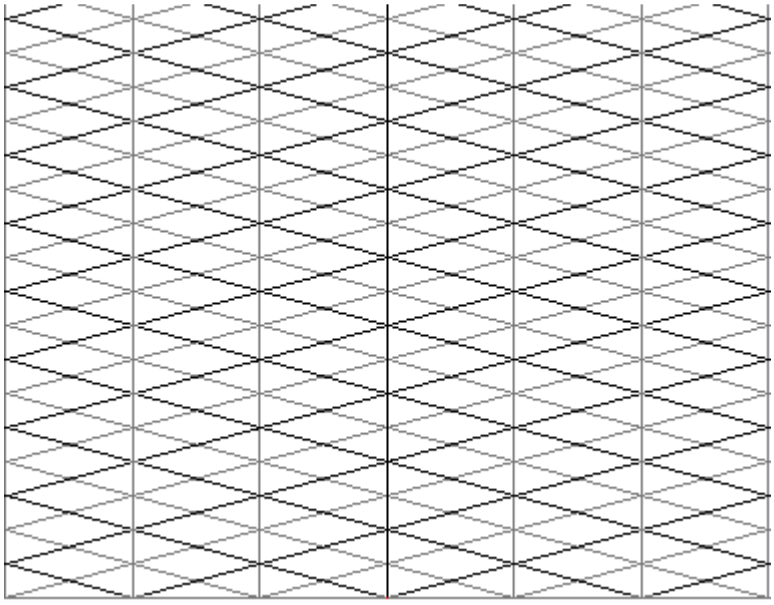
(a) $z = 2$



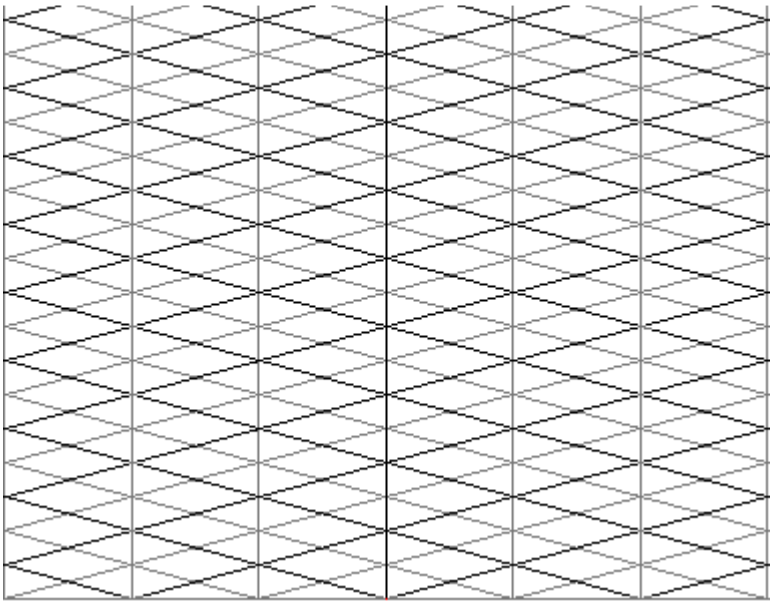
(b) $r = \frac{1}{2}z$



(c) $r = 2\cos\theta$



(d) $z = r^2 \cos^2 \theta$



[6] Find an equation in spherical coordinates for the equation given in rectangular coordinates.

(a) $z = 2$

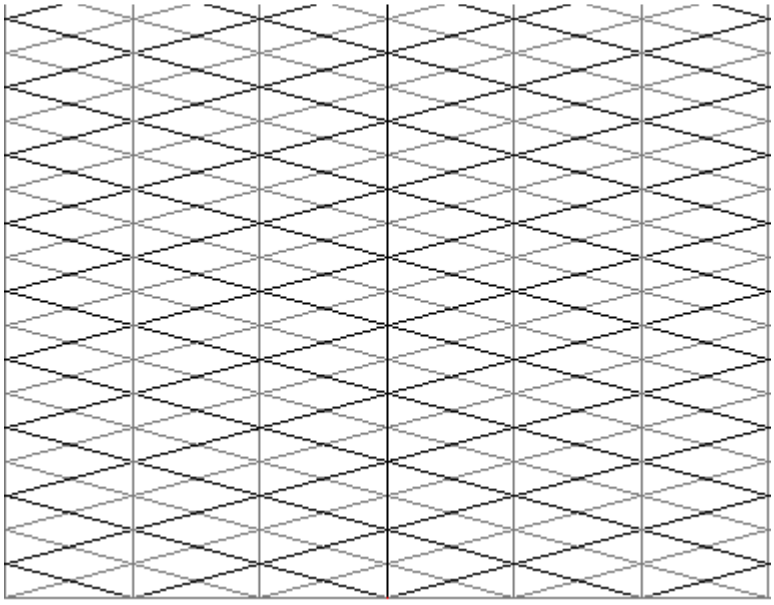
(b) $x^2 + y^2 - 3z^2 = 0$

(c) $x = 10$

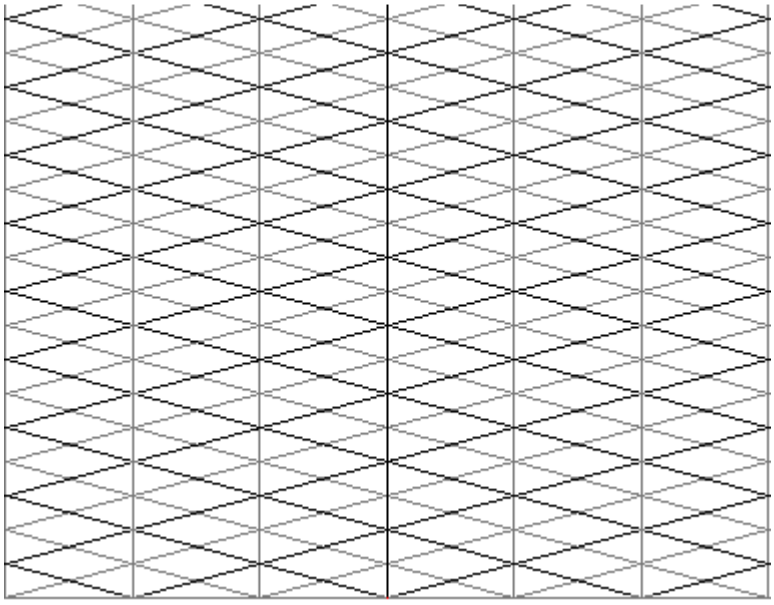
(d) $x^2 + y^2 + z^2 - 9z = 0$

[7] Find an equation in rectangular coordinates for the equation given in spherical coordinates, and sketch its graph.

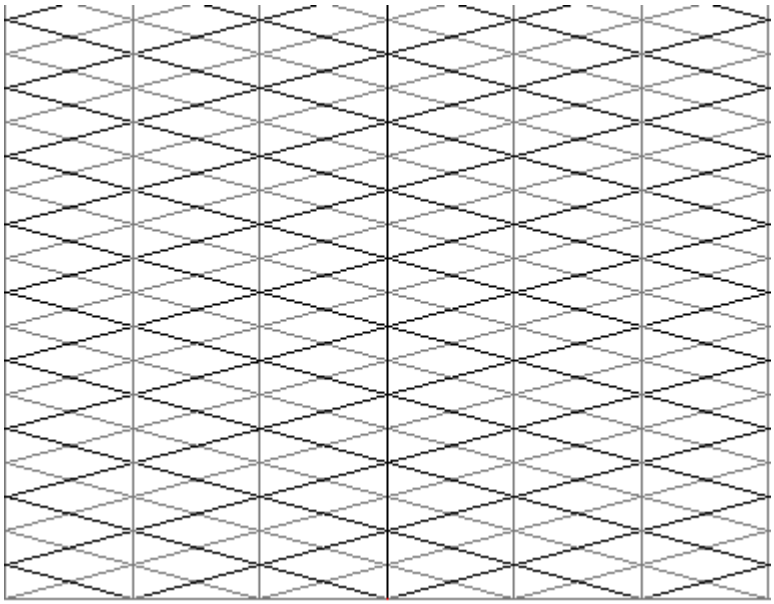
(a) $\theta = \dfrac{3\pi}{4}$



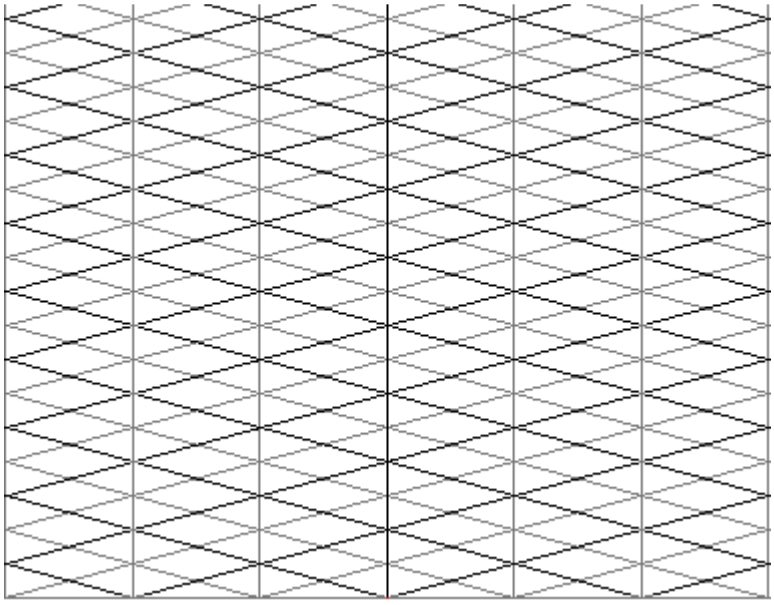
(b) $\phi = \dfrac{\pi}{2}$



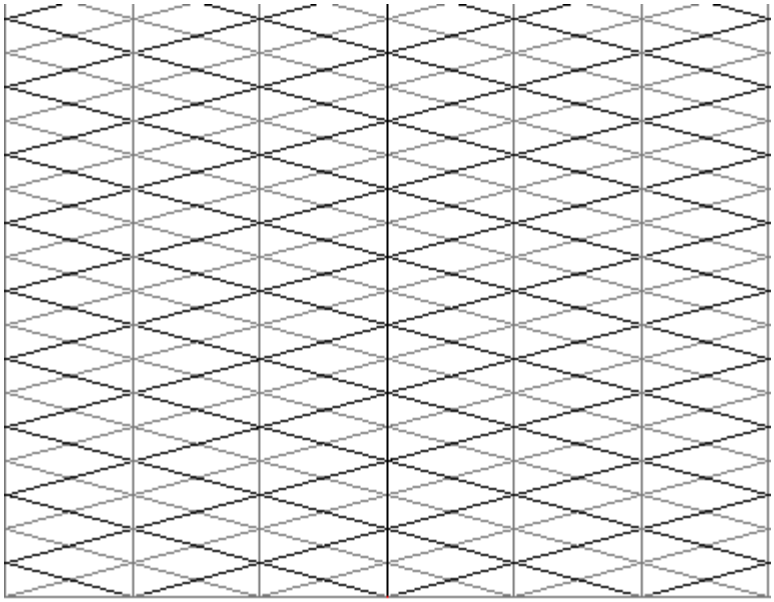
(c) $\rho = 3\sec\phi$

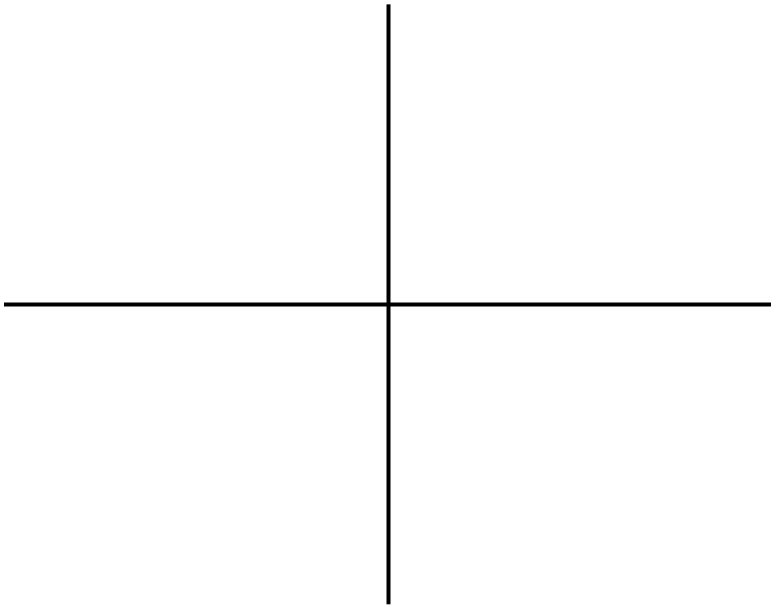


(d) $\rho = 4\csc\phi\sec\theta$



[8] Let V be the volume of the solid inside the sphere $x^2 + y^2 + z^2 = 4$ and below the plane $z = -1$. Express V as an integral in (a) cylindrical coordinates and (b) spherical coordinates.





[9] Let Q be the solid inside the sphere $x^2 + y^2 + z^2 = 4$ and outside the cylinder $x^2 + y^2 = 1$. Express the volume of Q as an iterated integral in(a)cylindrical coordinates and(b)spherical coordinates.