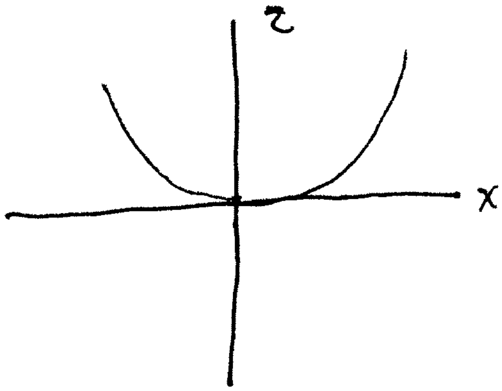
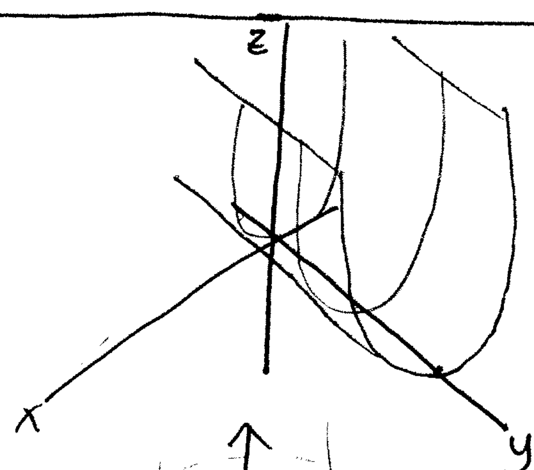
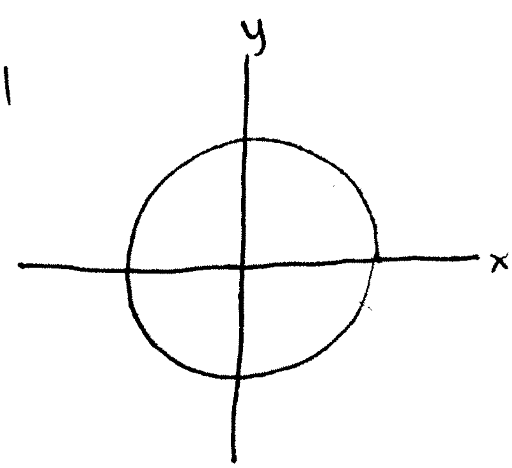
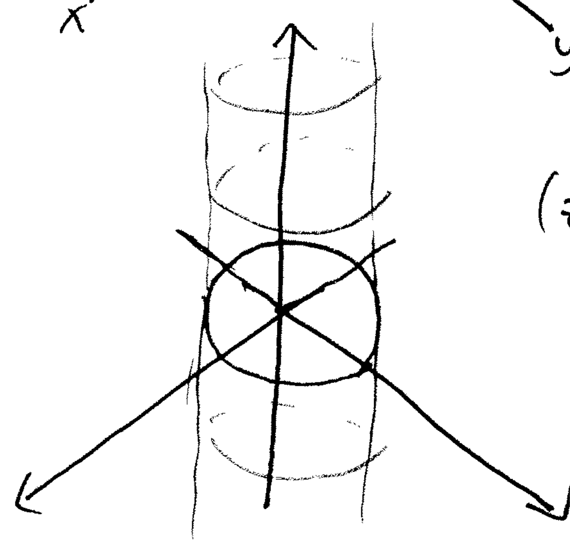
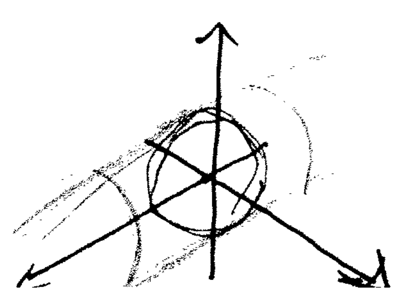
§12.6 – Cylinders & quadric surfaces

<u>Note</u>: I'll say very little about this & on the test, you'll have matching eq's ⟷ pics based <u>only</u> on Table 1 + #21-28 of §12.6.

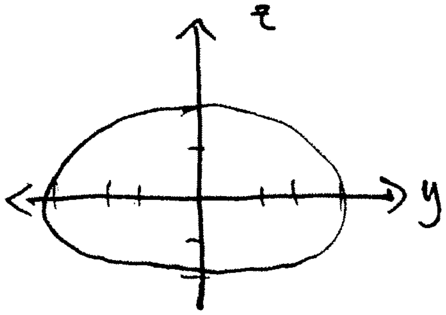
<u>Ideas</u>: ① Letting $y=f(x)$ (e.g) turns a 2D curve into a cylinder.

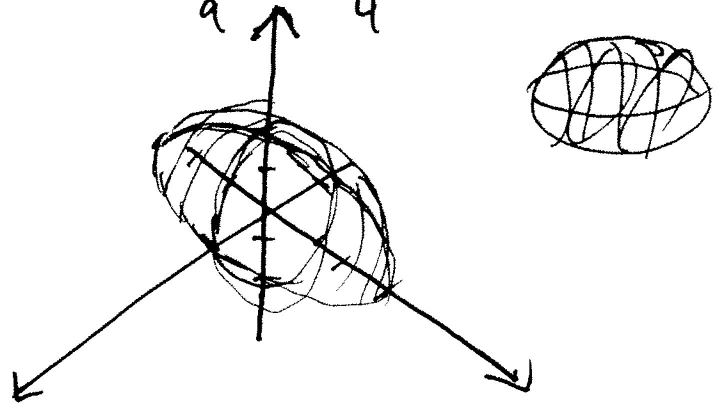
	2D	3D	
$z=x^2$			($y=$ anything)
$x^2+y^2=1$			($z=$ anything)
$y^2+z^2=1$	↑ same w/ x & z.		

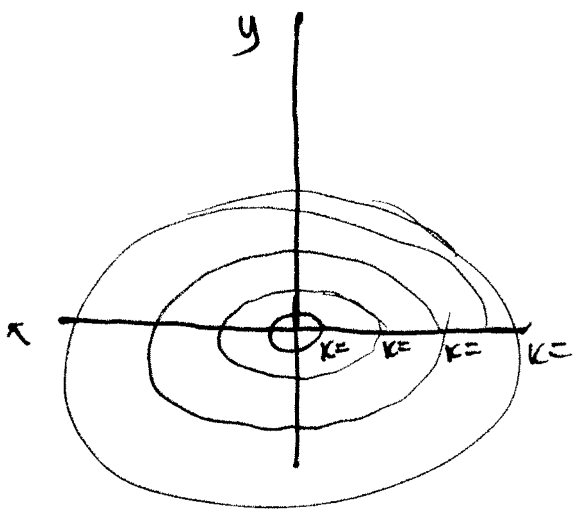
② 3D analogues of conics (in $\mathbb{R}^2$) are <u>quadrics</u>.

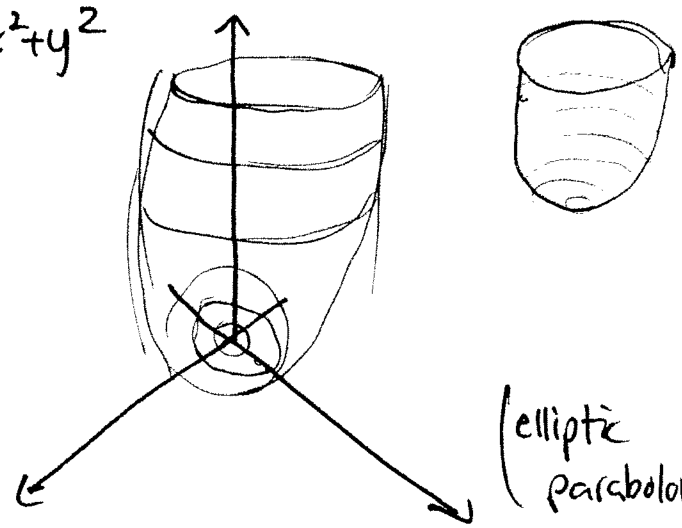
<u>Ex:</u>

2D	3D
• $\frac{y^2}{9}+\frac{z^2}{4}=1$	(e.g) $x^2+\frac{y^2}{9}+\frac{z^2}{4}=1$
• $4x^2+y^2=k$	$z=4x^2+y^2$









(elliptic paraboloid)

so can graph quadric surfaces using their intersections w/ planes $x=k$, $y=k$, & $z=k$.

intersections = <u>traces</u>.