

In[1]:= **Solve**[{**x**<sup>2</sup> + **y**<sup>2</sup> + (**z** - **d**)<sup>2</sup> == **r**<sup>2</sup>, **x** / **x0** == **y** / **y0**, **x** / **x0** == **z** / **z0**},  
**{x, y, z}**]

Out[1]= 
$$\left\{ \left\{ \begin{aligned} y &\rightarrow \frac{d y_0 z_0}{x_0^2 + y_0^2 + z_0^2} - \frac{y_0 \sqrt{4 d^2 z_0^4 + 4 (-d^2 + r^2) z_0^2 (x_0^2 + y_0^2 + z_0^2)}}{2 z_0 (x_0^2 + y_0^2 + z_0^2)}, \\ x &\rightarrow \frac{d x_0 z_0}{x_0^2 + y_0^2 + z_0^2} - \frac{x_0 \sqrt{4 d^2 z_0^4 + 4 (-d^2 + r^2) z_0^2 (x_0^2 + y_0^2 + z_0^2)}}{2 z_0 (x_0^2 + y_0^2 + z_0^2)}, \\ z &\rightarrow \frac{2 d z_0^2 - \sqrt{4 d^2 z_0^4 + 4 (-d^2 + r^2) z_0^2 (x_0^2 + y_0^2 + z_0^2)}}{2 (x_0^2 + y_0^2 + z_0^2)} \end{aligned} \right\}, \right.$$

$$\left. \left\{ \begin{aligned} y &\rightarrow \frac{d y_0 z_0}{x_0^2 + y_0^2 + z_0^2} + \frac{y_0 \sqrt{4 d^2 z_0^4 + 4 (-d^2 + r^2) z_0^2 (x_0^2 + y_0^2 + z_0^2)}}{2 z_0 (x_0^2 + y_0^2 + z_0^2)}, \\ x &\rightarrow \frac{d x_0 z_0}{x_0^2 + y_0^2 + z_0^2} + \frac{x_0 \sqrt{4 d^2 z_0^4 + 4 (-d^2 + r^2) z_0^2 (x_0^2 + y_0^2 + z_0^2)}}{2 z_0 (x_0^2 + y_0^2 + z_0^2)}, \\ z &\rightarrow \frac{2 d z_0^2 + \sqrt{4 d^2 z_0^4 + 4 (-d^2 + r^2) z_0^2 (x_0^2 + y_0^2 + z_0^2)}}{2 (x_0^2 + y_0^2 + z_0^2)} \end{aligned} \right\} \right\}$$