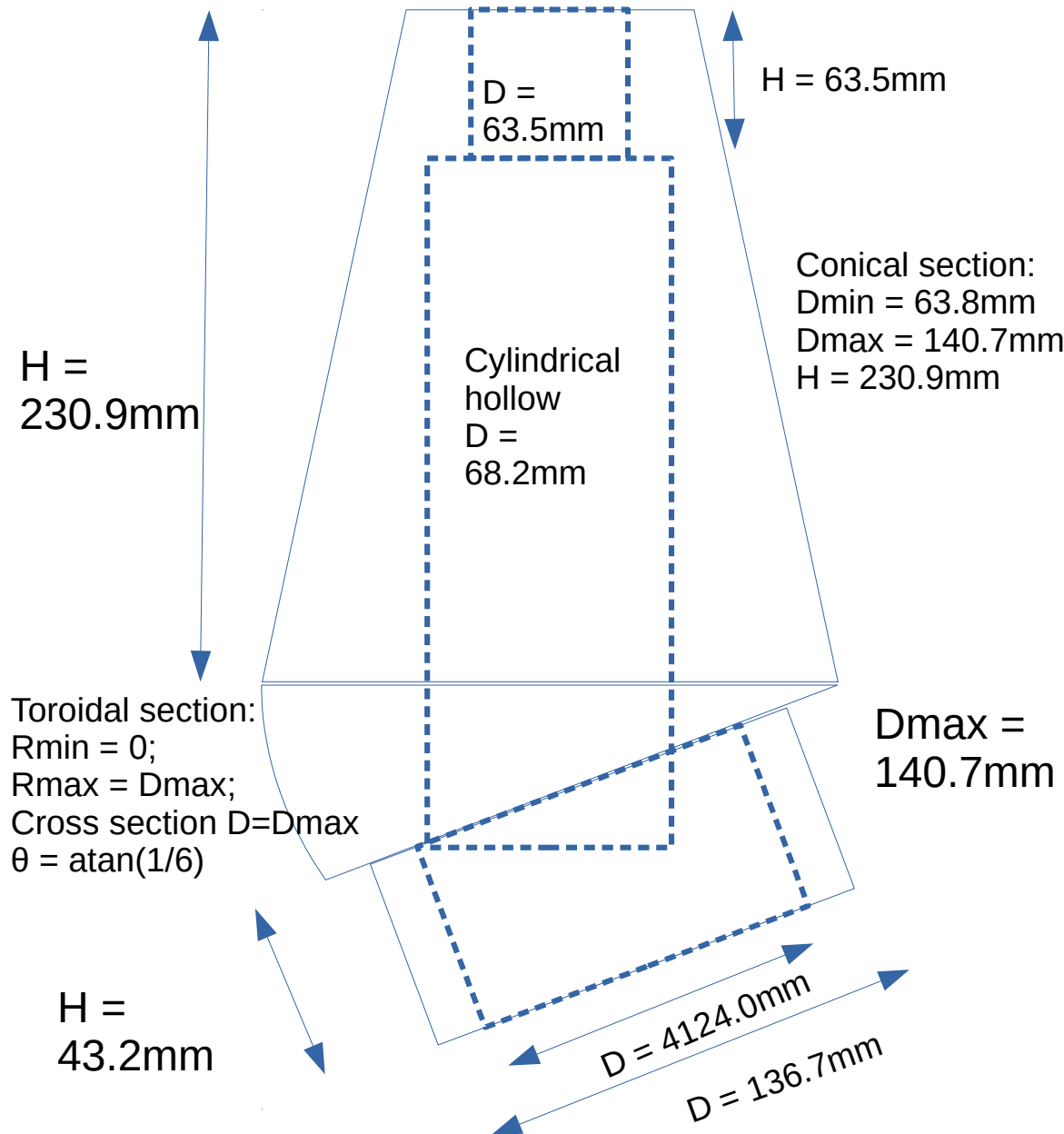




Nosecone: 3:1 aspect ratio cone with spherical tip

$$D_{min} = D(1 - L/(3D)) = 63.8\text{mm}$$



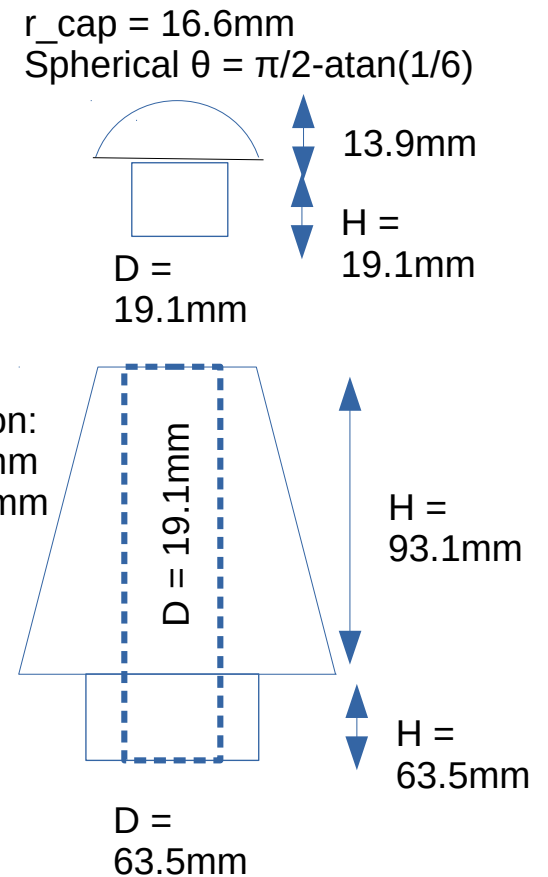
$$L = 337.8\text{mm}$$

$$L_c = 3 \times D_{max} = 422.1\text{mm}$$

$$r_{cap} = (L_c - L)/(\sqrt{37}-1) = 16.6\text{mm}$$

$$d_{min} = 12(L_c - L)/(37 - \sqrt{37}) = 31.5\text{mm}$$

$$h = L - 230.9\text{mm} - (L_c - L)/\sqrt{37} = 93.1\text{mm}$$



Central support: 120 deg symmetry

$$r(z, \theta) = \min \left\{ \frac{\Delta x + a \left\{ 1 - \sqrt{1 - \frac{36 \Delta x}{37 a} \left(2 + \frac{\Delta x}{a} \right) \tan^2(\theta)} \right\}}{\left(1 + \frac{36}{37} \tan^2(\theta) \right) \cos(\theta)}, R_{bus} (1 - z/Y) \right\} \quad z = \{0, Y\}$$

$$\theta = \{-60 \text{ deg}, 60 \text{ deg}\}$$

$$r(z, \theta) = \min \left\{ \frac{\Delta x + a_0 \left\{ 1 - \sqrt{1 - \frac{36 \Delta x}{37 a_0} \left(2 + \frac{\Delta x}{a_0} \right) \tan^2(\theta)} \right\}}{\left(1 + \frac{36}{37} \tan^2(\theta) \right) \cos(\theta)}, R_{bus} - t_{wall} \right\} \quad z = \{-z_{shoulder}, 0\}$$

$$a = [\sqrt{R^2 + L_c^2} - z] \tan(\phi) = [\sqrt{R^2 + L_c^2} - z] / 6 \quad b = [\sqrt{R^2 + L_c^2} - z] \frac{\sin(\phi)}{\cos^2(\phi)} = \frac{\sqrt{37}}{36} [\sqrt{R^2 + L_c^2} - z]$$

$$\phi = \text{atan}(1/6)$$

$$Y = 203.2 \text{ mm}$$

$$L_c = 6R = 422.1 \text{ mm}$$

$$R = 70.4 \text{ mm}$$

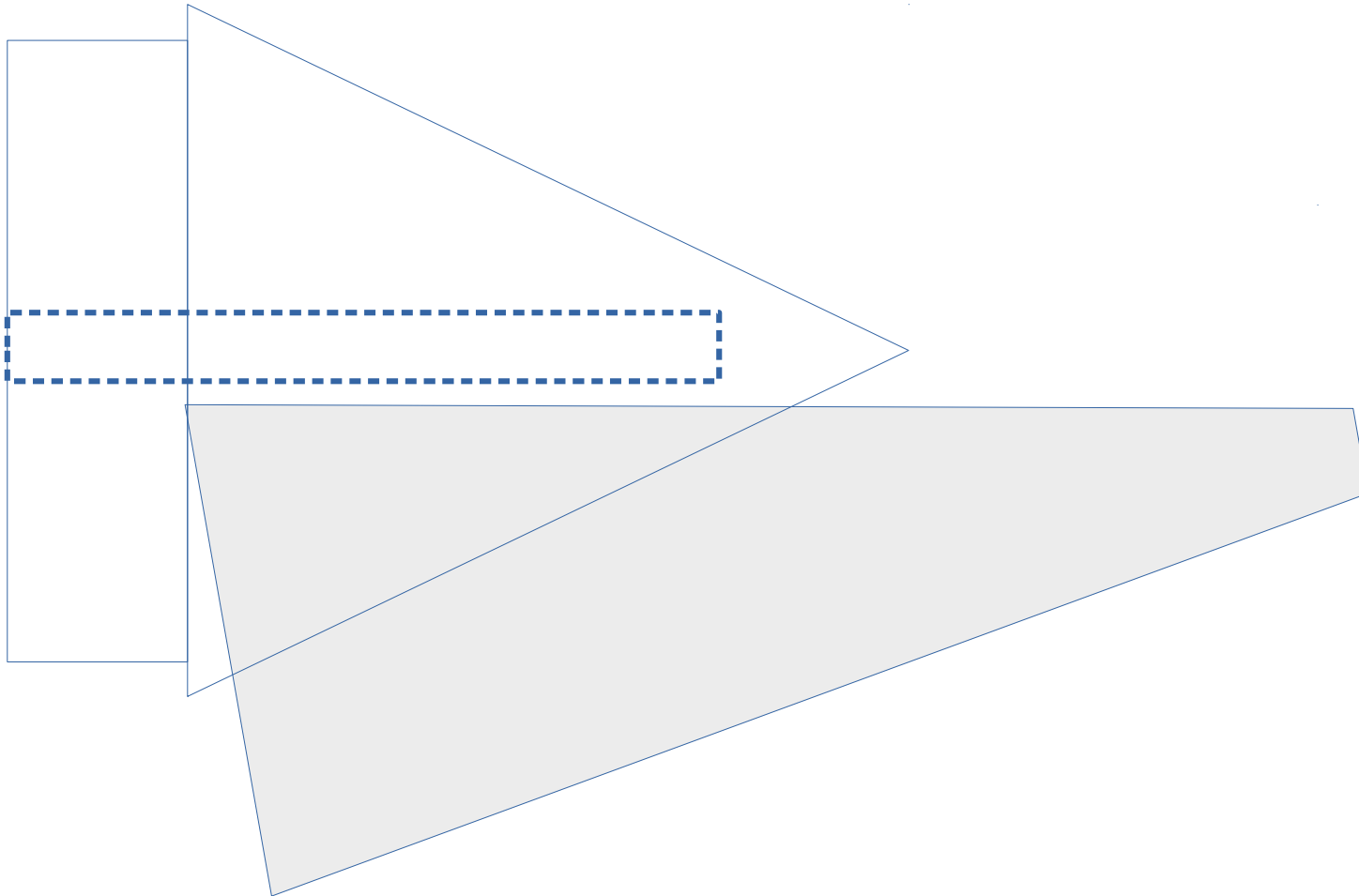
$$D = 10.2 \text{ mm}$$

$$R_{bus} = 97.4 \text{ mm}$$

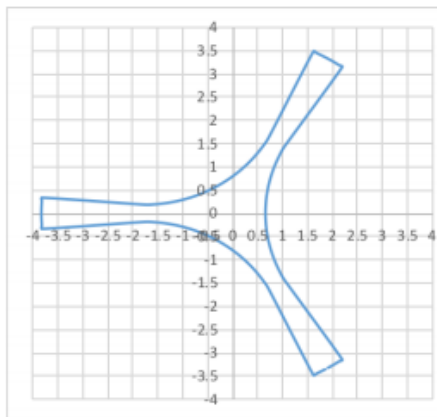
$$z_{shoulder} = 50.8 \text{ mm}$$

$$\Delta x = \frac{(2 - \sqrt{3})R + d}{\sqrt{3}} = 16.8 \text{ mm}$$

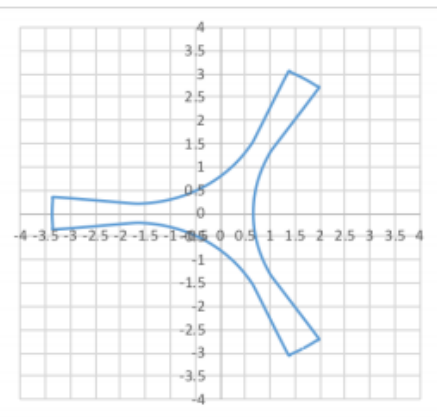
Central support: 120 deg symmetry



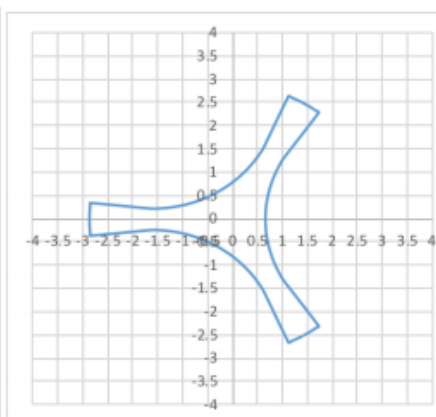
Central support: 120 deg symmetry



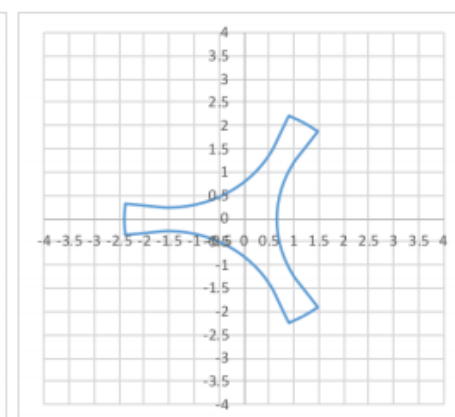
$z = 0$



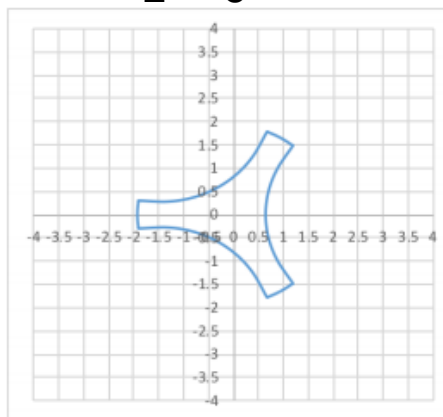
$z = 1''$



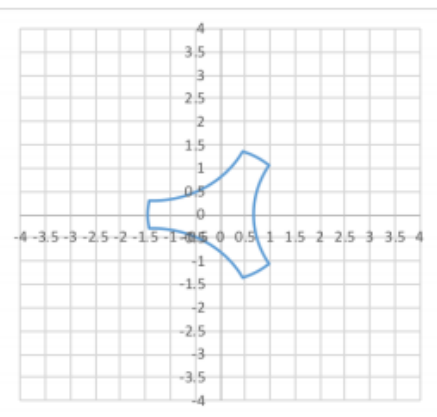
$z = 2''$



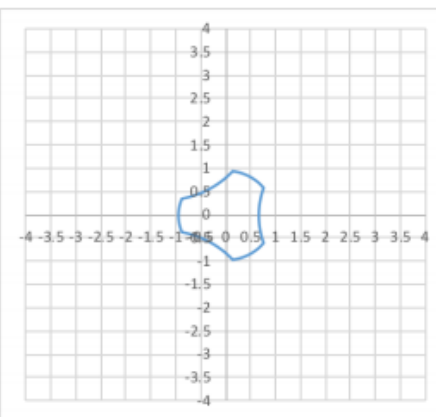
$z = 3''$



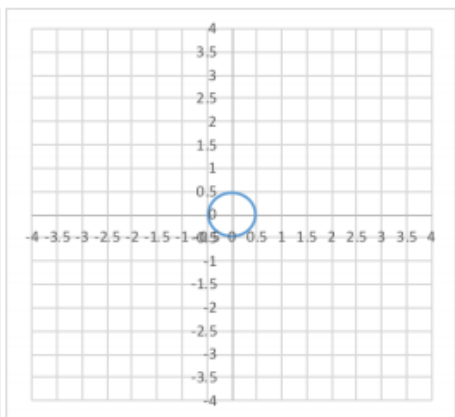
$z = 4''$



$z = 5''$



$z = 6''$



$z = 7''$

Nosecone shrouds

$$r = \{ \max \{ R_N(z) - \Delta R_w, R - \Delta x_c \}, R_N(z) \}$$

$$\phi = \{ -\phi_c(z), \phi_c(z) \}$$

$$\frac{R_N(z)}{R_{Nmax}} = \frac{z}{L_s} \left[1 - \frac{R - \Delta x_c}{R_{Nmax}} \right] + \frac{R - \Delta x_c}{R_{Nmax}}$$

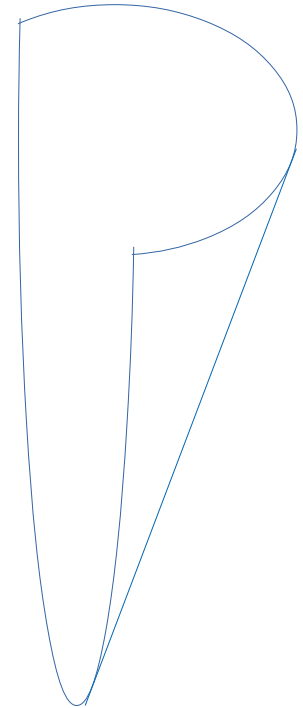
$$\phi_c(z) = \arccos \left[\frac{R^2 - r^2 - \Delta x_c^2}{2 \Delta x_c r} \right]$$

$$\Delta x_c = (2 R_{Nmax} + \Delta) / \sqrt{3} = (140.7 \text{ mm} + 10.2 \text{ mm}) / \sqrt{3} = 87.1 \text{ mm}$$

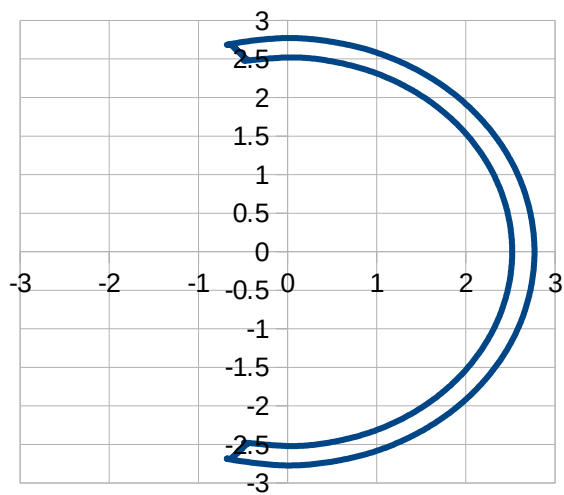
$$R_{Nmax} = 70.4 \text{ mm}$$

$$R = 97.4 \text{ mm}$$

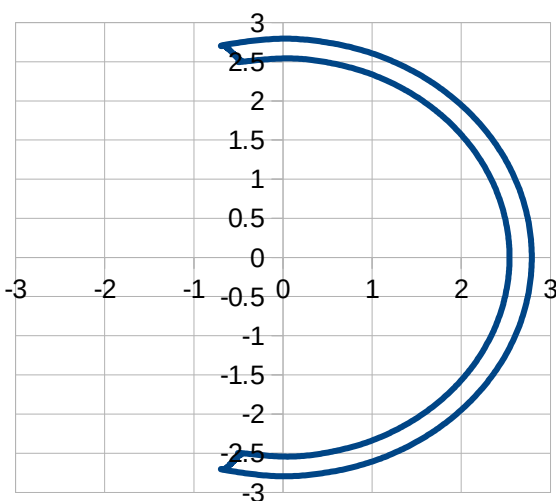
$$\Delta R_{wall} = 6.4 \text{ mm}$$



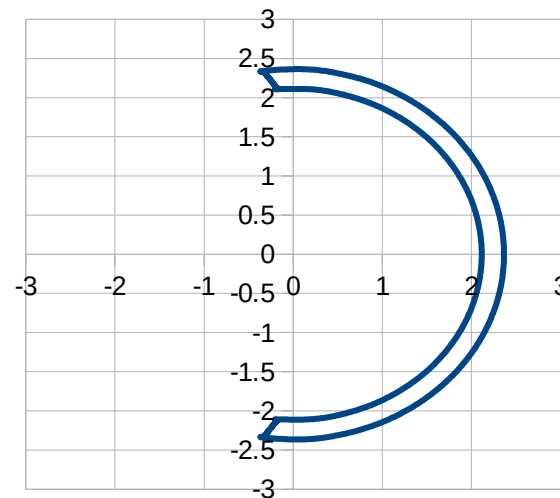
Nosecone shrouds



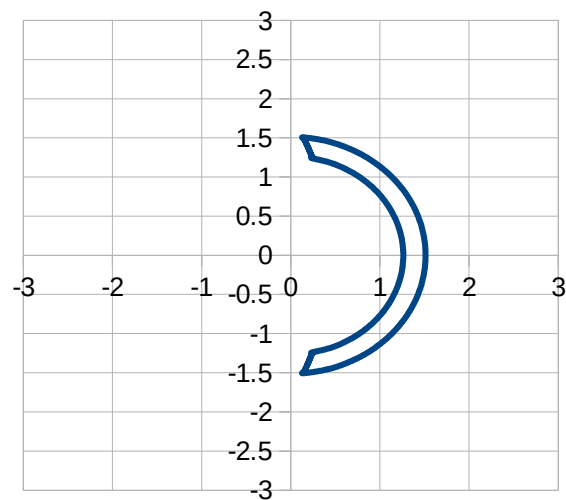
$Z = 6.5''$



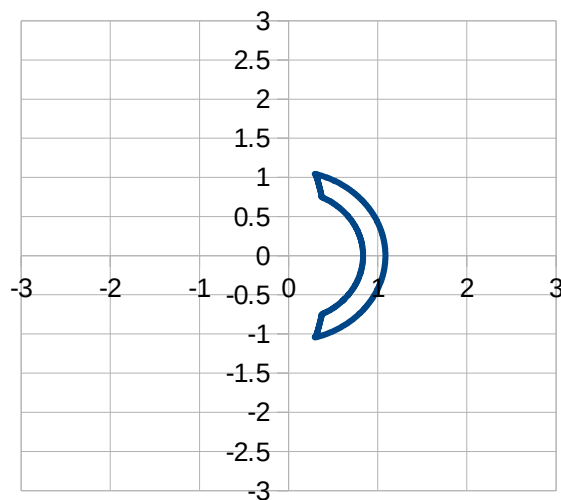
$Z = 5.5''$



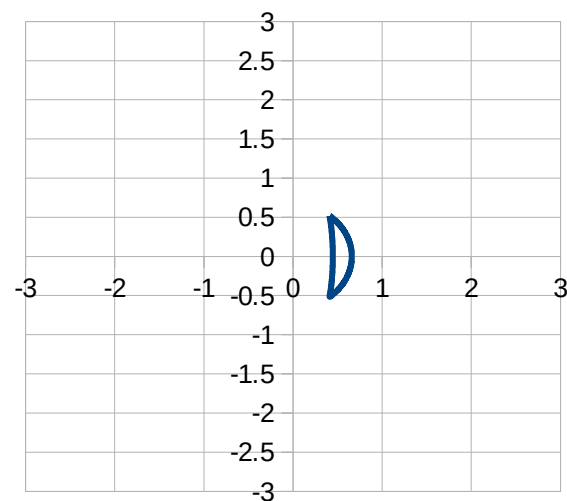
$Z = 4.5''$



$Z = 2.5''$



$Z = 1.5''$



$Z = 0.5''$