You may find the following identities useful: \( \sin^2 x = \frac{1}{2}(1 - \cos 2x) \) and \( \cos^2 x = \frac{1}{2}(1 + \cos 2x) \)

1. Carefully sketch the polar curve given by \( r = 1 - \sin \theta \).

2. Find the area inside both \( r = \sin \theta \) and \( r = \cos \theta \), the shaded area in the figure. 

   By symmetry, we consider only the bottom half.

   \[
   \frac{1}{2} \int_0^{\pi/2} \sin^2 \theta \, d\theta = \frac{1}{2} \int_0^{\pi/2} (1 - \cos 2\theta) \, d\theta = \frac{1}{2} \left( \frac{\pi}{2} - \frac{1}{2} \sin 2\theta \right) 
   \]

   \[= \frac{1}{2} \left( \frac{\pi}{4} - \frac{1}{2} \right) = \frac{\pi - 2}{8} \]

3. Use an appropriate trigonometric substitution to integrate.

   \[
   \int \frac{x^3}{\sqrt{1 - x^2}} \, dx 
   \]

   Let \( x = \sin \theta \), so \( 1 - x^2 = 1 - \sin^2 \theta = \cos^2 \theta \)

   \[
   dx = \cos \theta \, d\theta \]

   \[
   \int \frac{\sin^3 \theta}{\cos \theta} \, d\theta = \int \sin^2 \theta \, d\theta = \int (1 - \cos^2 \theta) \sin \theta \, d\theta 
   \]

   Let \( u = \cos \theta \), \( du = -\sin \theta \, d\theta \)

   \[
   = \int (u^2 - 1) \, du = \frac{u^3}{3} - u + C = \frac{\cos^3 \theta}{3} - \cos \theta + C 
   \]

   \[
   = \frac{1}{3} \left( \sqrt{1-x^2} \right)^3 - \sqrt{1-x^2} + C 
   \]

   So \( \cos \theta = \sqrt{1-x^2} \)