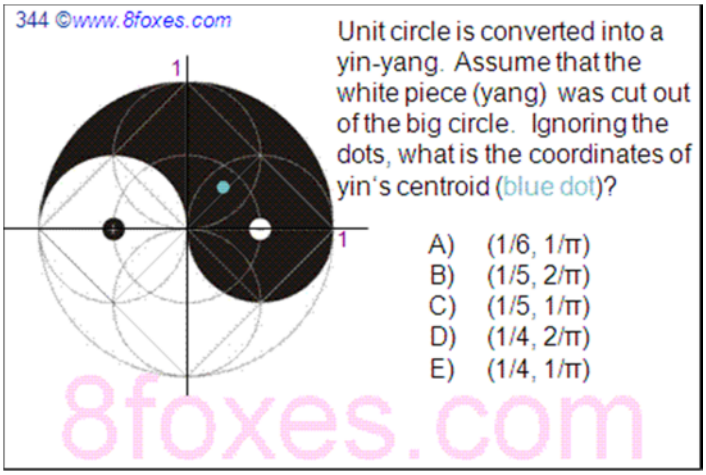
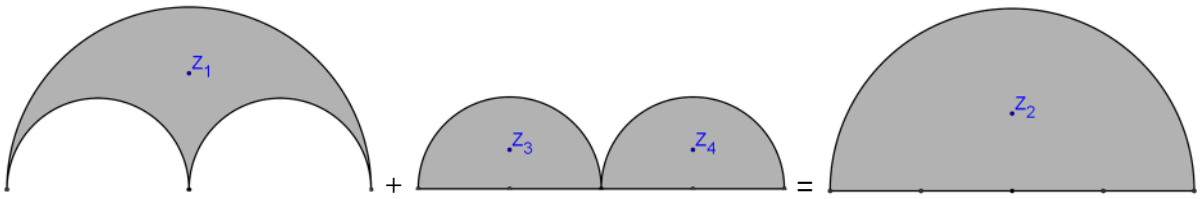


Solution:



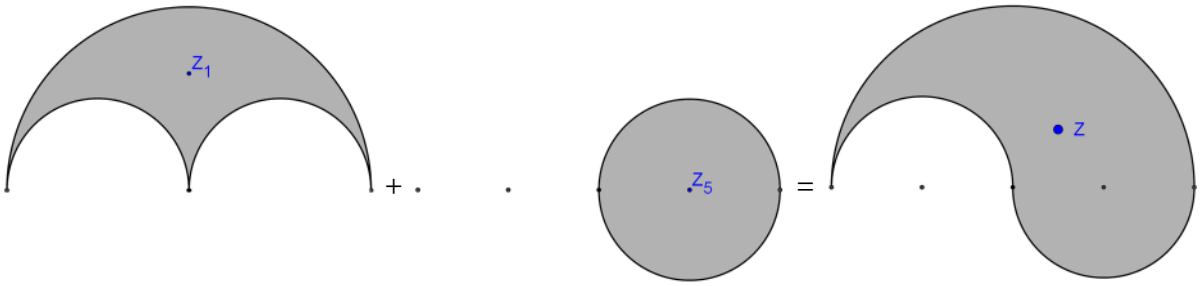
$m_1 = \frac{1}{2}\left(\pi \cdot 1^2 - 2 \cdot \pi \cdot (\frac{1}{2})^2\right) = \frac{\pi}{4}$ $\quad m_3 = m_4 = \frac{1}{2} \cdot \pi \cdot (\frac{1}{2})^2 = \frac{\pi}{8}$ $\quad m_2 = \frac{1}{2} \cdot \pi \cdot 1^2 = \frac{\pi}{2}$

$y_1 = ?$ $\quad y_3 = y_4 = \frac{2}{3\pi}$ $\quad y_2 = \frac{4}{3\pi}$

So: $y_1 \cdot m_1 + y_3 \cdot m_3 + y_4 \cdot m_4 = y_2 \cdot m_2 \rightarrow y_1 \cdot \frac{\pi}{4} + 2 \cdot \frac{2}{3\pi} \cdot \frac{\pi}{8} = \frac{4}{3\pi} \cdot \frac{\pi}{2} \rightarrow y_1 \cdot \frac{\pi}{4} = \frac{2}{3} - \frac{1}{6} = \frac{1}{2}$

And we find $y_1 = \frac{2}{\pi}$.

Further $x_1 = 0$, because of the symmetry.



$m_1 = \frac{\pi}{4}$ $\quad m_5 = \pi \cdot (\frac{1}{2})^2 = \frac{\pi}{4}$ $\quad m_Z = \frac{\pi}{4} + \frac{\pi}{4} = \frac{\pi}{2}$

$y_1 = \frac{2}{\pi}$ $\quad y_5 = 0$ $\quad y_Z = ?$

$x_1 = 0$ $\quad x_5 = \frac{1}{2}$ $\quad x_Z = ?$

Because $m_1 = m_5$, is the centroid Z the midpoint of Z_1 and Z_5.

$x_Z = \frac{1}{2}(x_1 + x_5) = \frac{1}{4}$ and $y_Z = \frac{1}{2}(y_1 + y_5) = \frac{1}{\pi}$

The correct answer is E: $Z = \left(\frac{1}{4}, \frac{1}{\pi}\right)$