(17) Option 1:

$$A = \int_0^{\frac{\pi}{2}} \frac{1}{2}\left[(2+2\cos\theta)^2 - (2\cos\theta)^2\right] d\theta + \int_{\frac{\pi}{2}}^{\pi} \frac{1}{2}(2+2\cos\theta)^2 \, d\theta$$

Option 2:

$$A = \int_0^{\pi} \frac{1}{2}(2+2\cos\theta)^2 d\theta - \underbrace{\int_0^{\frac{\pi}{2}} \frac{1}{2}(2\cos\theta)^2 \, d\theta}_{\substack{\text{area of semicircle of radius } 1 \\ = \frac{1}{2}\pi}}$$

We'll do option 2.

$$A = \int_0^{\pi} \frac{1}{2}(4+8\cos\theta+4\cos^2\theta)\, d\theta - \frac{\pi}{2} = \int_0^{\pi} (2+4\cos\theta+2\cos^2\theta) d\theta - \frac{\pi}{2}$$

$$= \int_0^{\pi} (2+4\cos\theta + \cancel{2}(\cancel{\tfrac{1}{2}})(1+\cos 2\theta))\, d\theta - \frac{\pi}{2} = \int_0^{\pi} (3+4\cos\theta+\cos 2\theta) d\theta - \frac{\pi}{2}$$

$$= 3\theta\Big|_0^{\pi} + 4\sin\theta\Big|_0^{\pi} + \frac{1}{2}\sin 2\theta\Big|_0^{\pi} - \frac{\pi}{2} = 3\pi + 0 + 0 - \frac{\pi}{2} = \frac{5\pi}{2}$$