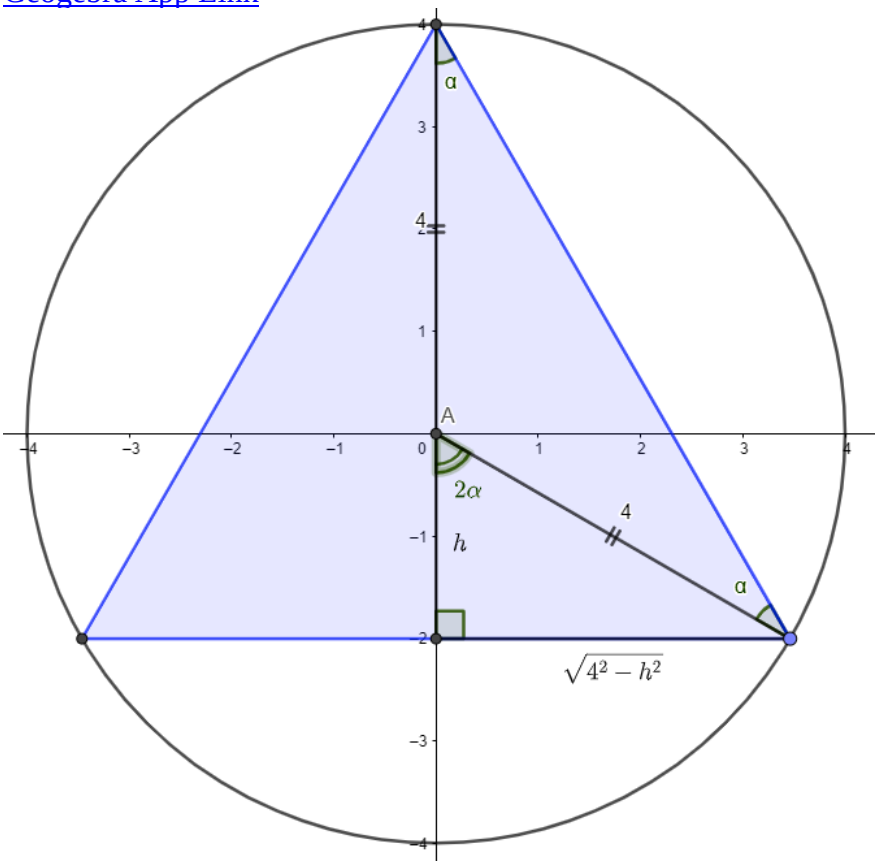
Larson Section 3-7 #26

[Geogebra App Link]



Feasible domain for h is $0 \le h \le 4$	Feasible domain for α is $0 \le \alpha \le \frac{\pi}{4}$
$A(h) = \frac{1}{2}\left(2\sqrt{4^2+h}\right)(4+h)$ $= \left(16+h^2\right)^{\frac{1}{2}} \cdot (4+h)$ $\downarrow$ $A'(h) = \frac{1}{2}\left(16+h^2\right)^{-\frac{1}{2}} \cdot (2h) \cdot (4+h) + \left(16+h^2\right)^{\frac{1}{2}}$ $A'(h) = 0$ or DNE when $x = 2$ $A(0) = 16$ $A(2) = 12\sqrt{3} \approx 20.7846...$ $A(4) = 0$	$A(\alpha) = \frac{1}{2}\left(4+4\cos(2\alpha)\right)\left(2\left[4\sin(2\alpha)\right]\right)$ $= \frac{1}{2} \cdot 4 \cdot 4\left(1+\cos(2\alpha)\right)\left(2\sin(2\alpha)\right)$ $= 8\left(1+\cos(2\alpha)\right)\left(2\sin(2\alpha)\right)$ $= 8\left[2\sin(2\alpha) + 2\sin(2\alpha)\cos(2\alpha)\right]$ $= 8\left[2\sin(2\alpha) + \sin(4\alpha)\right]$ $\downarrow$ $A'(\alpha) = 8\left[2\cos(2\alpha) \cdot 2 + \cos(4\alpha) \cdot 4\right]$ $A'(\alpha) = 0$ or DNE when $x = \frac{\pi}{6}$ $A\left(\frac{\pi}{4}\right) = 16$ $A\left(\frac{\pi}{6}\right) = 12\sqrt{3} \approx 20.7846...$ $A(0) = 0$