

2.59  
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$AD = 2x \leftarrow DE = x$   
 $AE = \sqrt{21-3x^2}$   
 $AB = \sqrt{21-3x^2} - x$   
 $f = 4x + \sqrt{21-3x^2} + \sqrt{21-3x^2} - x = 4x + 2\sqrt{21-3x^2}$

$f' = 4 - \frac{2 \cdot 6x}{2\sqrt{21-3x^2}} = 4 - \frac{6x}{\sqrt{21-3x^2}}$   
 $4\sqrt{21-3x^2} = 6x \quad | :2$   
 $4(21-3x^2) = 9x^2 \rightarrow 84 = 27x^2 \rightarrow x^2 = 4$   
 $x = 2$   
 (בגובה 4, אורכי היסודות 8 ו-12)

$f(2) = 8 + 2\sqrt{21-12} = 8 + 2 \cdot 3 = 14$   
 $f(0) = 2\sqrt{21}$

$x=0$  אצל  $x=2$ , קצרה יותר

$x = \sqrt{7} \leftarrow \sqrt{21-3x^2} = 0 \leftarrow CE = 0$   
 $CD = x$

$f(\sqrt{7}) = 4\sqrt{7} + 2 \cdot 0 = 4\sqrt{7}$

אכיון ש- $4\sqrt{7} < 14$  הריאן המצוי הוא בולט.

פתרון נוסף:

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$\frac{x}{\sin \alpha} = \frac{\sqrt{21}}{\sin 60}$   
 $x = \frac{\sqrt{21} \sin \alpha}{\sin 60}$   
 $\frac{?}{\sin(\alpha+60)} = \frac{\sqrt{21}}{\sin 60} \rightarrow ? = \frac{\sqrt{21} \sin(\alpha+60)}{\sin 60}$

$f = \frac{\sqrt{21} \sin \alpha}{\sin 60} + \frac{2\sqrt{21} \sin(\alpha+60)}{\sin 60} - \frac{\sqrt{21} \sin \alpha}{\sin 60} = \frac{2\sqrt{21} \sin(\alpha+60)}{\sin 60} + \frac{\sqrt{21} \sin \alpha}{\sin 60}$

$f' = 0 = 2g(\alpha+60) + g\alpha$   
 $0 = 2g\alpha + 2g60 - 2\sin \alpha \sin 60 + g\alpha = g\alpha - \sqrt{3} \sin \alpha + 2g60$   
 $\tan \alpha = \frac{2}{\sqrt{3}}$   
 $\frac{1}{\cos^2 \alpha} = 1 + \tan^2 \alpha = 1 + \frac{4}{3} = \frac{7}{3} \rightarrow \cos \alpha = \sqrt{\frac{3}{7}} \quad \sin \alpha = \sqrt{\frac{4}{7}}$   
 (בסימנים חיוביים)

$f(x) = \frac{\sqrt{21}}{\sin 60} \left[ 2\sin \alpha \sin 60 + 2\cos \alpha \sin 60 + \sin \alpha \right]$   
 $= \frac{\sqrt{21}}{\sin 60} \left[ 2 \cdot \sqrt{\frac{4}{7}} \cdot \frac{1}{2} + 2 \cdot \sqrt{\frac{3}{7}} \cdot \frac{\sqrt{3}}{2} + \sqrt{\frac{4}{7}} \right] = 2\sqrt{7} \left[ \frac{2}{\sqrt{7}} + \frac{3}{\sqrt{7}} + \frac{2}{\sqrt{7}} \right] =$   
 $= 2\sqrt{7} \cdot \frac{7}{\sqrt{7}} = 14$