Bellwork Geo Tuesday, May 5, 2020

Find the area of regular 24-gon whose radius is 10in long. Round to the nearest hundredth.

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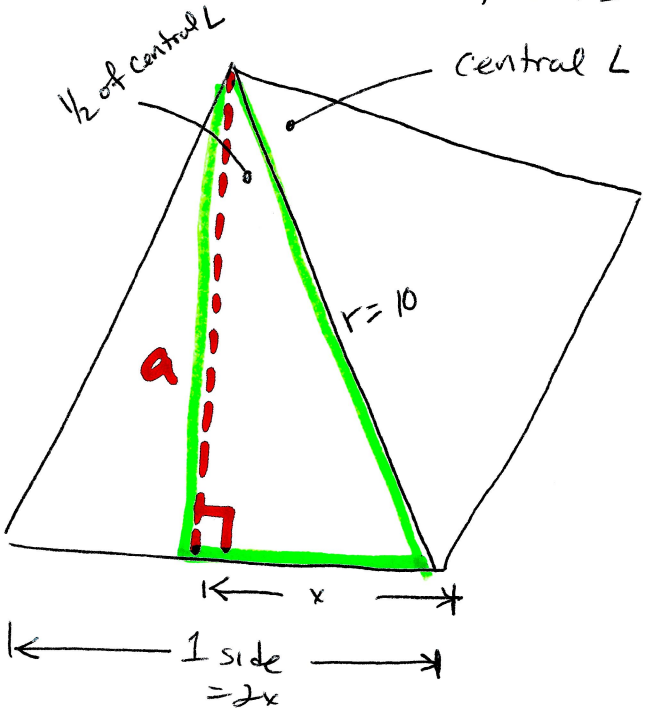
ANSWERS

Find the area of regular 24-gon whose radius is 10in long. Round to the nearest hundredth.

Shown are 2 of 24 $\cong \Delta$s formed by drawing all 24 radii.

central $\angle = 360 \div 24 = 15°$



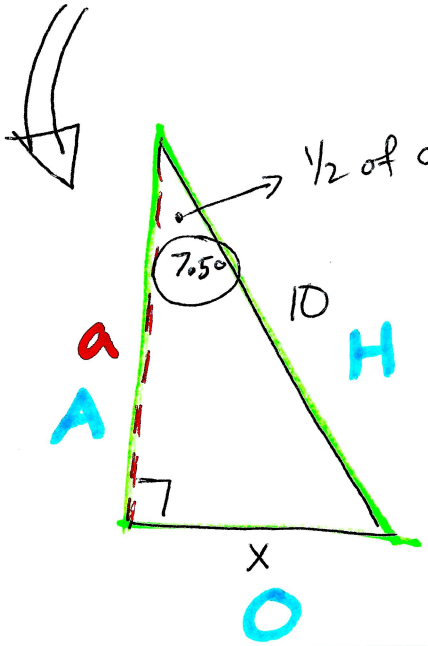
$A = \frac{1}{2} a \cdot p$

perimeter = 62.88 in

apothem =

$A = \frac{1}{2}(9.91)(62.88)$

$A = 311.57 \text{ in}^2$



for x SOHCAHTOA

$\sin 7.5° = \frac{x}{10}$

$x = 10 \cdot \sin(7.5) = 1.31$

1 side = 2x = 2(1.31) = 2.62

perimeter = 24(1 side)

= 24(2.62)

$p = 62.88 \text{ in}$

for a SOHCAHTOA

$\cos 7.5° = \frac{a}{10}$

$a = 10 \cdot \cos(7.5) = 9.91 \text{ in}$