

**SOML MEET III**  
**EVENT 2**  
**Applications of Trigonometry**

**NAME:** \_\_\_\_\_  
**TEAM:** \_\_\_\_\_  
**SCHOOL:** \_\_\_\_\_

1. [2 Points] From a point level with and 1000 feet away from the base of the Washington Monument, the angle of elevation to the top of the monument is 29.05 degrees. Determine the height of the monument to the nearest half-foot.

ANS:

2. [3 Points] Assume your eyes are 3" apart. If both eyes focus on an object directly in front of you and the two lines of sight (one from each eye) meet at a 5-degree angle, how far is the object from you? Round your answer to the nearest hundredth.

ANS:

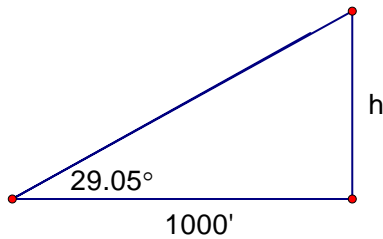
3. [5 Points] A regular decagon (ten sides) is inscribed in a circle of radius 10 cm. Find the area of the decagon. Round your answer to one decimal place.

ANS:

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1. [2 Points] From a point level with and 1000 feet away from the base of the Washington Monument, the angle of elevation to the top of the monument is 29.05 degrees. Determine the height of the monument to the nearest half-foot.

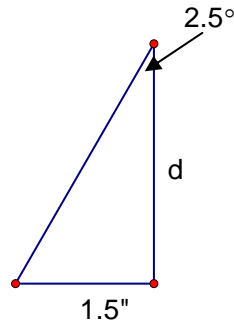
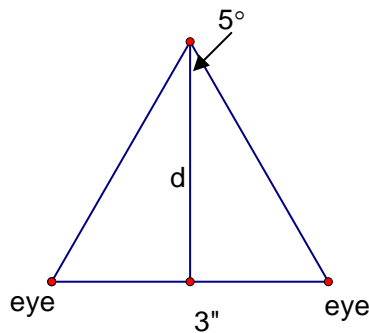


$$\tan 29.05 = \frac{h}{1000}$$

$$h = 1000(\tan 29.05)$$

**ANS: 555 ½ feet**

2. [3 Points] Assume your eyes are 3'' apart. If both eyes focus on an object directly in front of you and the two lines of sight (one from each eye) meet at a 5-degree angle, how far is the object from you? Round your answer to the nearest hundredth.

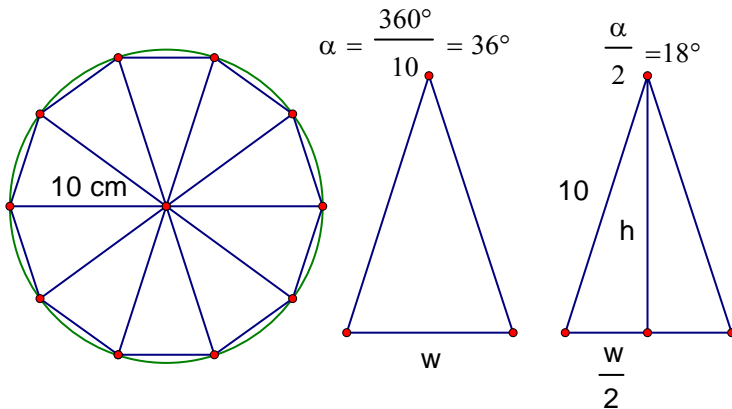


$$\tan(2.5) = \frac{1.5}{d}$$

$$d = \frac{1.5}{\tan(2.5)}$$

**ANS: 34.36''**

3. [5 Points] A regular decagon (ten sides) is inscribed in a circle of radius 20 cm. Find the area of the decagon. Round your answer to one decimal place.



$$\sin\left(\frac{\alpha}{2}\right) = \frac{w}{20}$$

$$\cos\left(\frac{\alpha}{2}\right) = \frac{h}{10}$$

$$w = 20 \sin(18) \quad h = 10 \cos(18)$$

$$\text{Area of diagram} = 10(\text{Area of Representative triangles})$$

$$= 10\left(\frac{1}{2}(w)(h)\right)$$

$$= \frac{10}{2}(20 \sin(18))(10 \cos(18))$$

$$= 1000(\sin(18))(\cos(18)) \approx 293.9 \text{ cm}$$

**ANS: 293.9 cm**