

SOML MEET 3

NAME: _____

EVENT I

TEAM: _____

APPLICATIONS OF GEOMETRY

SCHOOL: _____

1. [2 Points] If a knit scarf 8 inches x 30 inches required 150 feet of yarn, how much would be needed for a comparable scarf 5 inches x 32 inches?

ANS: _____

2. [3 Points] The inside of a piece of luggage measures: length = 60 cm, width = 15.5 cm, height = 54.5 cm. What is the maximum length of a stiff object, if the thickness may be disregarded, that can be placed into the luggage? Round to the nearest tenth and include units.

ANS: _____

3. [5 Points] Find the volume of the largest cylinder whose lateral surface you can make with a rolled $8\frac{1}{2}$ " x 11" piece of paper. Round to the nearest hundredth and include units.

ANS: _____

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APPLICATIONS OF GEOMETRY

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1. [2 Points] If a knit scarf 8 inches x 30 inches required 150 feet of yarn, how much would be needed for a comparable scarf 5 inches x 32 inches?

Solution:

8 in x 30 in = 240 in² requires 150 ft.

5 in x 32 in = 160 in² requires ? ft.

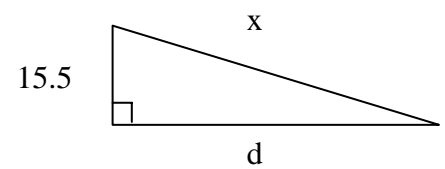
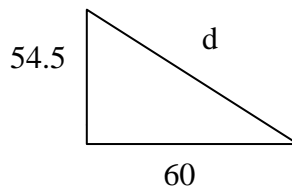
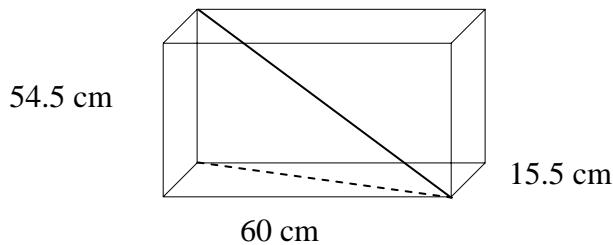
$$\frac{240}{160} = \frac{150}{x}$$

$$x = 100$$

ANS: 100 ft

2. [3 Points] The inside of a piece of luggage measures: length = 60 cm, width = 15.5 cm, height = 54.5 cm. What is the maximum length of a stiff object, if the thickness may be disregarded, that can be placed into the luggage? Round to the nearest tenth and include units.

Solution:



$$d^2 = 54.5^2 + 60^2$$

$$d^2 = 6570.25$$

$$x^2 = 15.5^2 + d^2$$

$$x^2 = 15.5^2 + 6570.25$$

$$x = 82.5$$

ANS: 82.5 cm

3. [5 Points] Find the volume of the largest cylinder whose lateral surface you can make with a rolled 8 1/2" x 11" piece of paper. Round to the nearest hundredth and include units.

Solution:

I. $C = 8.5, h = 11$

$$C = 8.5 = 2\pi r \Rightarrow r = \frac{4.25}{\pi}$$

$$V = \pi r^2 h = \pi \left(\frac{4.25}{\pi} \right)^2 (11) = \frac{11(4.25)^2}{\pi} = \frac{198.6875}{\pi}$$

$$C = 11 = 2\pi r \Rightarrow r = \frac{5.5}{\pi}$$

$$V = \pi r^2 h = \pi \left(\frac{5.5}{\pi} \right)^2 (8.5) = \frac{(5.5)^2 (8.5)}{\pi} = \frac{257.125}{\pi} \approx 81.85$$

II. $C = 11, h = 8.5$

ANS: 81.85 in³