# Maximizing the Volume of a Triangular Prism Given the Surface Area

# Note: The prism below is an equilateral triangle based prism

# What does that mean?

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# Triangular Prism Pattern (Solutions) MAP4C

These are the dimensions that should have been measured for each triangular prism.

1. S.A. = 100

s = 2

h = 16.09

V = 27.87

2. S.A. = 100

s = 3

h = 10.24

V = 39.93

3. S.A. = 100

s = 4

h = 7.18

V = 49.74

4. S.A. = 100

s = 5

h = 5.22

V = 56.54

5. S.A. = 100

s = 6

h = 3.82

V = 59.60

6. S.A. = 100

s = 7

h = 2.74

V = 58.16

Optimal Dimensions:

 S.A. = 100

 s = 6.20

 h = 2.90

 V = 59.70

# Find the Height in an Isosceles Triangle Based Prism

s

s

s

s

s

h

h

h

h

s

x

x

x

x

A2

A2

A1

A1

A3

s

s

h

#

# 5.9.3: Mission to Mars MAP4C

NASA is designing a tent structure that can be used as a habitat for a possible settlement on Mars. The tent structure will allow for winds to pass easily over the habitat but should also allow for a suitable amount of space inside the habitat. The material required for the tent is expensive, so NASA has determined that the tent will be made out of 200 square yards of material, which will be needed to cover all 5 sides of the structure.

s

s

h

The tent is going to be designed as a triangular based prism as shown. Complete the following table to determine the maximum volume of the tent.

Graph the results (side length vs. volume) on the grid on the back of this page.

(Round your answers to two decimal places)

 **Hint:**

Calculate h, using the formula:

