

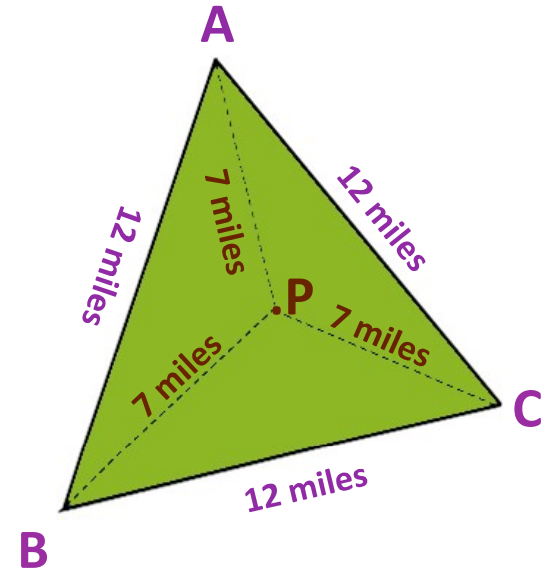
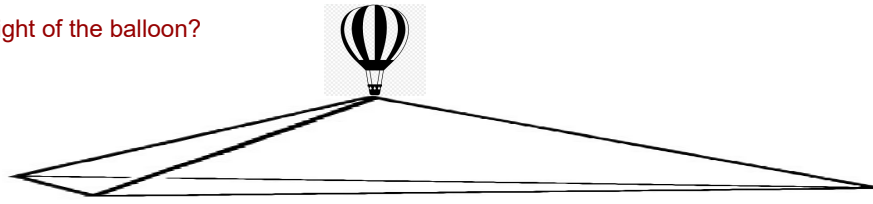
Oct-22
Problem of the Month

Hot Air Balloon
Idea from Walter Penney

Three towns in a rural flat area of Colorado are each 12 miles from the other two.

Mr. P is in a hot air balloon. At a certain point, he is exactly 7 miles from each of the towns.

Can you determine the height of the balloon?
Show your work.



Let the three towns be A, B & C

Let O = Central Midpoint between all three towns

Let P = Mr. P in hot air balloon directly above O (central midpoint)

Let a = the distance between each town = 12 miles

Let V be any of the 3 towns (vertex)

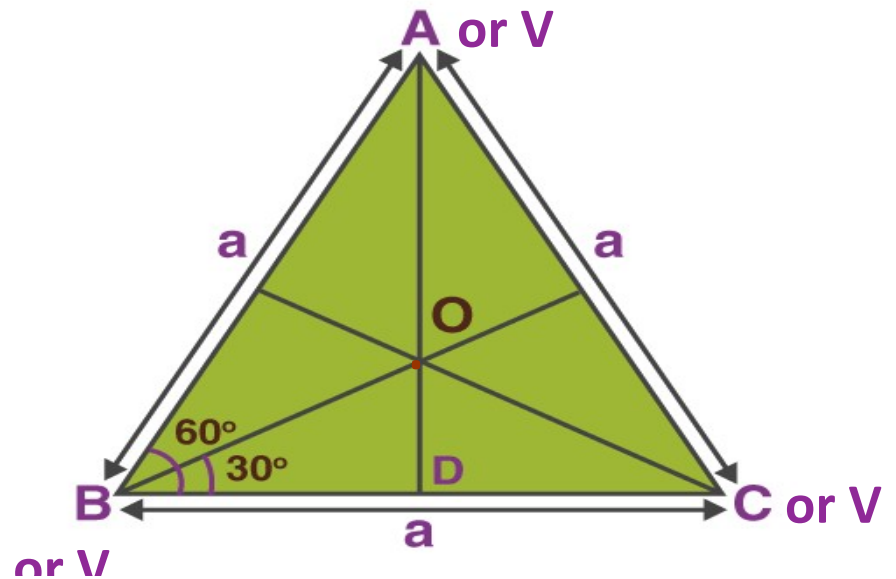
Let PV = the distance from P to any of the any of the towns = 7 miles

First find the distance from O (central midpoint) to V (any of the 3 towns)

Let OV = the distance from the O (central midpoint) to V (any of the towns).

$$OV = (a \times \sqrt{3}) / 3$$

$$OV = 6.92820323027551 \text{ miles}$$

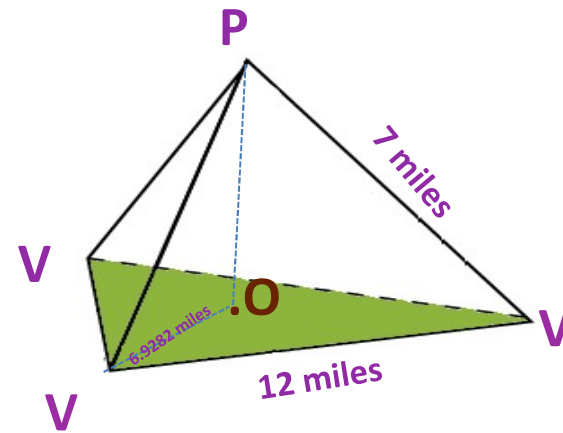


Let P = Mr. P in hot air balloon

Let V be any of the 3 towns (vertex)

Let PV = the distance from P to any of the any of the towns = 7 miles

Let PO = the distance from P to O, the Height of the Balloon with Mr. P. In it.



$$PO = \sqrt{PV^2 - OV^2}$$

$$PO = \sqrt{7^2 - 6.9282^2}$$

$$PO = \sqrt{49 - 48}$$

$$PO = \sqrt{1}$$

$$PO = 1 \text{ mile}$$

The Height of the Balloon with Mr. P. In it is 1 mile

