

SOML MEET 3

EVENT 3

Volume

NAME: _____

TEAM: _____

SCHOOL: _____

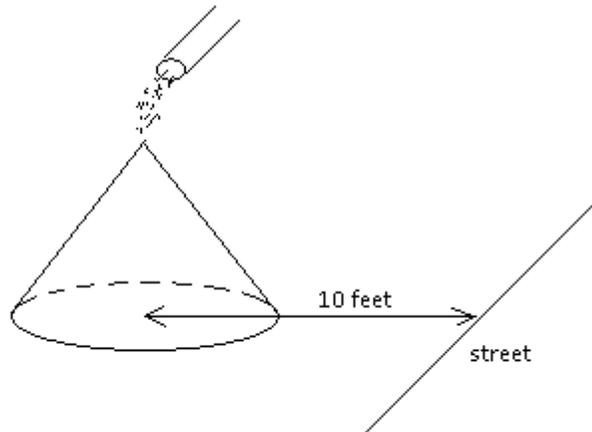
1. [2 Points] The number of fish that can be put in an aquarium depends on the maximum amount of water the tank holds and the size of the fish. Suppose you have a box style aquarium with dimensions of length, width, and height being 40 cm, 20 cm, and 30 cm, respectively. If the recommended number of tropical fish for this tank is 20, how many cubic centimeters of space would each fish have?

ANS: _____ cm^3

2. [3 Points] The volume of a Pyramid is obtained by $V=(1/3)BH$, where B is the area of the base and H is the height. Suppose Pyramid A has a height of 148 m and a square base with a perimeter of 930 m, and Pyramid B has a height of 260 m and a square base with a perimeter of 140 m. How many times greater is the volume of Pyramid A than the volume of Pyramid B? Round the answer to the nearest hundredth.

ANS: _____

3. [5 Points] Grain is being emptied from a storage bin and piled on the ground. The pile of grain has the shape of a right circular cone whose height and diameter are equal. If grain is being added to the pile at a constant rate of 3 cubic feet per minute, how long will it take for the pile to reach a street that is 10 feet from the center of the pile? Round your answer to the nearest tenth of an hour.



ANS: _____ hours

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1. [2 Points] The number of fish that can be put in an aquarium depends on the maximum amount of water the tank holds and the size of the fish. Suppose you have a box style aquarium with dimensions of length, width, and height being 40 cm, 20 cm, and 30 cm, respectively. If the recommended number of tropical fish for this tank is 20, how many cubic centimeters of space would each fish have?

Solution: $40 \times 20 \times 30/20 = 1200$

ANS: 1200 cm^3

2. [3 Points] The volume of a Pyramid is obtained by $V=(1/3)BH$, where B is the area of the base and H is the height. Suppose Pyramid A has a height of 148 m and a square base with a perimeter of 930 m, and Pyramid B has a height of 260 m and a square base with a perimeter of 140 m. How many times greater is the volume of Pyramid A than the volume of Pyramid B? Round the answer to the nearest hundredth.

Solution:

$$V_A = \left(\frac{1}{3}\right)\left(\frac{930}{4}\right)^2 (148) = 2,666,775 \text{ m}^3$$

$$V_B = \left(\frac{1}{3}\right)\left(\frac{140}{4}\right)^2 (260) = 106,166.\bar{6} \text{ m}^3$$

$$\frac{V_A}{V_B} = \frac{2,666,775}{106,166.\bar{6}} \approx 25.119 \approx 25.12$$

ANS: 25.12

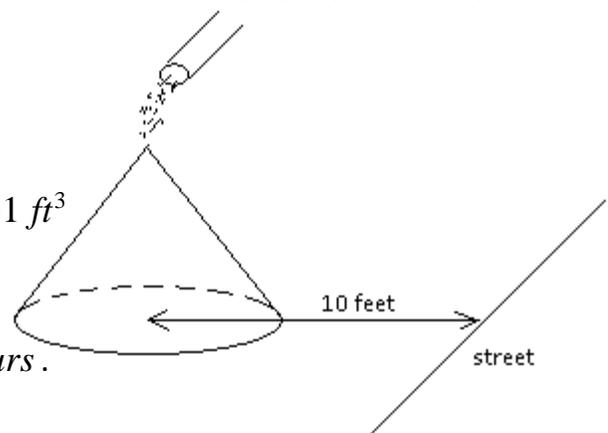
3. [5 Points] Grain is being emptied from a storage bin and piled on the ground. The pile of grain has the shape of a right circular cone whose height and diameter are equal. If grain is being added to the pile at a constant rate of 3 cubic feet per minute, how long will it take for the pile to reach a street that is 10 feet from the center of the pile? Round your answer to the nearest tenth of an hour.

Solution:

When the pile reaches the street it will have radius 10 feet and height 20 feet.

Its volume will be: $V = \frac{1}{3}\pi(10^2)(20) \approx 2094.3951 \text{ ft}^3$

Since the grain is being added to the pile at a constant rate of 180 cubic feet per hour, it will take $2094.3951/180 \approx 11.6355 \approx 11.6 \text{ hours}$.



ANS: 11.6 hours