



MULTI-STEP VOLUME PROBLEMS ON TAKS

Below are examples of multi-step volume problems in multiple choice format. Try solving the problems before looking at the solutions. (Cover the solutions with a piece of paper.) Then check your solutions against the ones given.

1. A rectangular swimming pool has a length of 22 feet and a width of 8 feet. Water is pumped into the pool at a rate of 32 cubic feet per minute. How long will it take to fill the pool to a height of 6 feet?

A 16 min
B 33 min
C 528 min
D 938 min

Solution

$$\begin{aligned}\text{Volume of water in pool} &= lwh \\ &= 22 \cdot 8 \cdot 6 = 1056 \text{ ft}^3\end{aligned}$$

Divide the volume by the rate at which the pool is filled.

$$1056 \text{ ft}^3 \div 32 \text{ ft}^3/\text{min} = 33 \text{ min}$$

It will take 33 minutes to fill the pool to a height of 6 feet.

The correct answer is B.

(A) **(B)** **(C)** **(D)**

2. A juice container is a rectangular prism that has a width of 11 centimeters, a length of 6 centimeters, and a height of 16 centimeters. You pour juice from the full container into cylindrical cups that each have a radius of 2 centimeters and a height of 7 centimeters. About how many cups will the juice from one container fill?

F 5
G 12
H 38
J 75

Solution

$$\begin{aligned}\text{Volume of container} &= lwh \\ &= 11 \cdot 6 \cdot 16 = 1056 \text{ cm}^3 \\ \text{Volume of cup} &= \pi r^2 h \\ &= \pi \cdot 2^2 \cdot 7 \\ &= 28\pi \approx 88 \text{ cm}^3\end{aligned}$$

$$1056 \text{ cm}^3 \div 88 \text{ cm}^3/\text{cup} = 12 \text{ cups}$$

The container will fill about 12 cups.

The correct answer is G.

(F) **(G)** **(H)** **(J)**

3. A bar of gold is a rectangular prism that is 8 centimeters long, 4 centimeters wide, and 2 centimeters tall. A cubic centimeter of gold has a mass of 19 grams. A gram of gold is worth \$14. How much is the bar of gold worth?

A \$1,216
B \$8,512
C \$17,024
D Not here

Solution

$$\begin{aligned}\text{Bar's volume} &= lwh \\ &= 8 \cdot 4 \cdot 2 = 64 \text{ cm}^3\end{aligned}$$

$$\text{Bar's mass} = 64 \text{ cm}^3 \cdot 19 \text{ g/cm}^3 = 1216 \text{ g}$$

$$\text{Bar's value} = 1216 \text{ g} \cdot \$14/\text{g} = \$17,024$$

The bar is worth \$17,024.

The correct answer is C.

(A) **(B)** **(C)** **(D)**