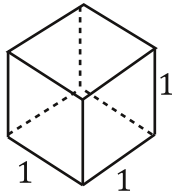


Volume of Prisms and Cylinders

How full can you go? How full can you go?

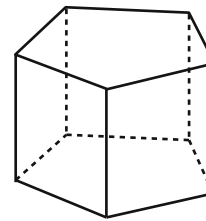
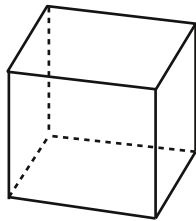
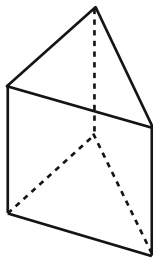
I think that line is supposed to be something different... Anyway, volume is important. You use it every day when you have your cereal, or you shampoo your hair, because it is the measure of how much stuff you can fit into something. Volume is measured in cubic units. Oh look, there goes one now!...



This is 1 unit x 1 unit X unit. So this is $1u^3$.

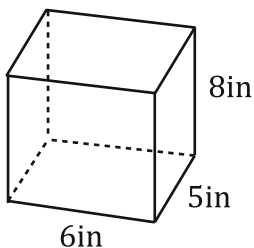
As you can see, this measurement is in three dimensions. If you multiply the length and width of the base, and then the height you get a cubic unit. Now we know we can fill this cube with $1u^3$ of milk, or cereal or shampoo or water or... whatever you want.

Prism: A prism is simply a three dimensional shape that has the same polygon on the top and the bottom. Like these....



To find the volume of a prism you must find the area of the base and multiply it by the height. Use the formula $V=Bh$ the capitol "B" means "the area of the base" Let's check out an example...

Ex 1. Find the volume. Step 1. Make sure all the dimesions are present and find the area of the base.



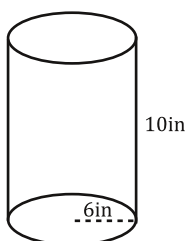
$$\begin{aligned} B &= bh \\ B &= 6 * 5 \\ B &= 30 \end{aligned}$$

Step 2. Find the volume.

$$\begin{aligned} V &= Bh \\ V &= 30 * 8 \\ V &= 240in^3 \end{aligned}$$

Notice step 1 says "make sure all dimensions are present." Sometimes you might have to solve for a dimension by using the Pythagorean theorem, trigonometry, or some other theorem or property.

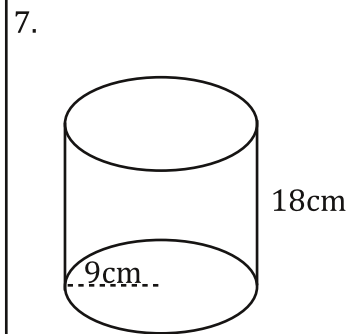
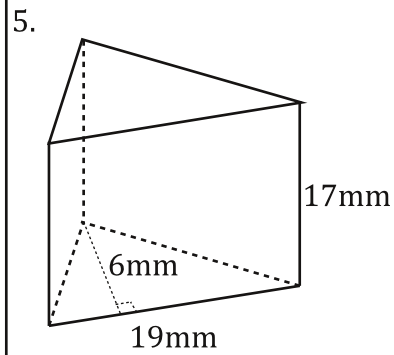
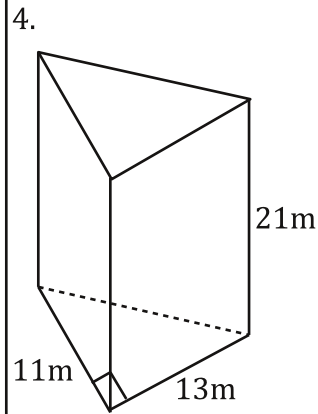
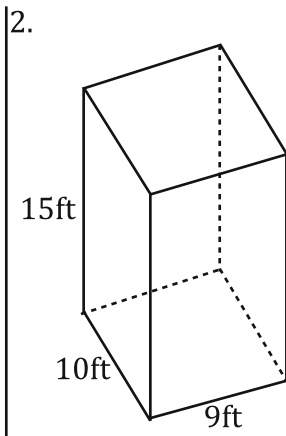
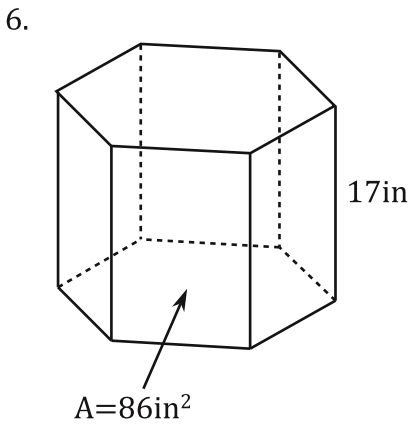
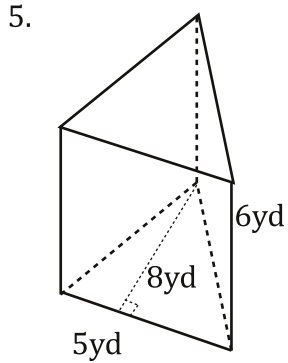
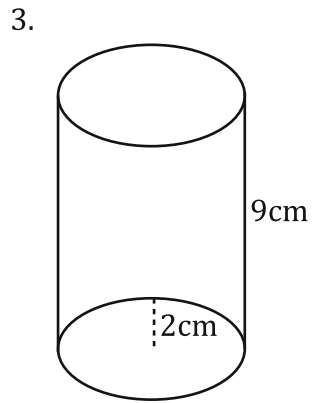
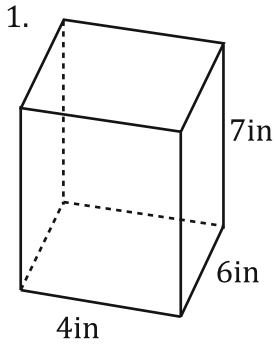
A cylinder is a prism that has a circle as its base instead of a polygon. Its volume is also $V=Bh$ except the B for a circle is πr^2 giving us $V=\pi r^2 h$. Let's look at examples of this one too.



$$\begin{aligned} V &= r^2 h \\ V &= \pi(6^2)10 \\ V &= \pi 36 * 10 \\ V &= 360\pi \\ V &\approx 1130.97in^3 \end{aligned}$$

Let's practice...

Calculate the volume of each figure...

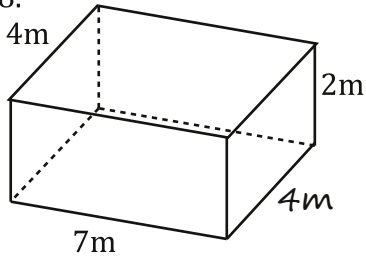


Bubble all the correct answers from above. Don't bubble incorrect answers.

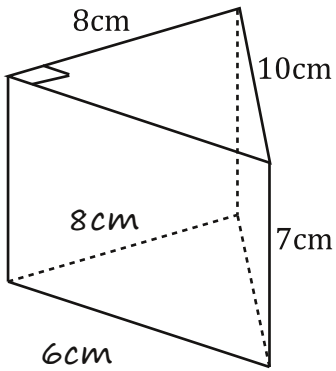
- 156
 1462
 113.1
 256
 168
 120
 1607
 986
 1501.5
 1405
 1350
 4580.44
 969
 4685.33

Find any missing dimensions and then find the volume of each figure.

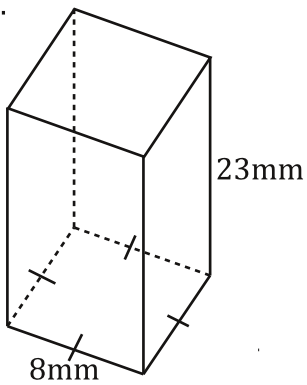
8.



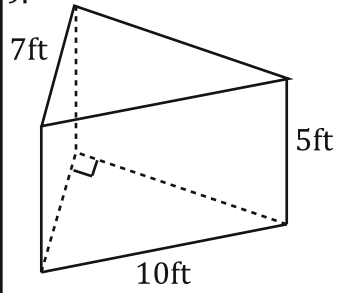
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12.

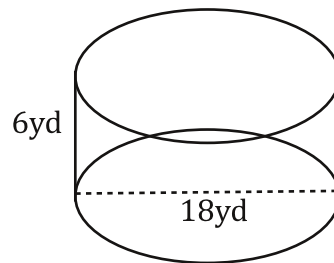


9.

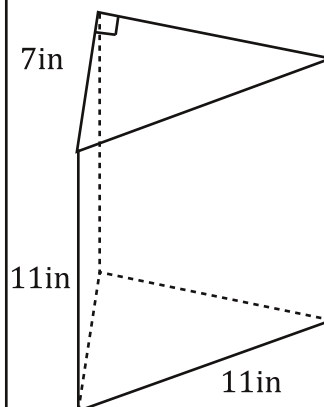


hint: Pythagorean theorem?

11.



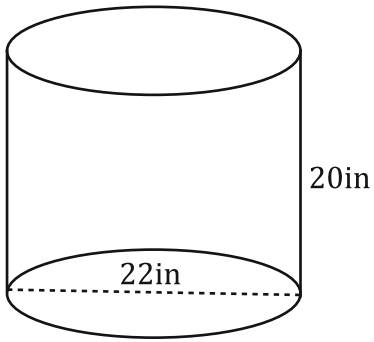
13.



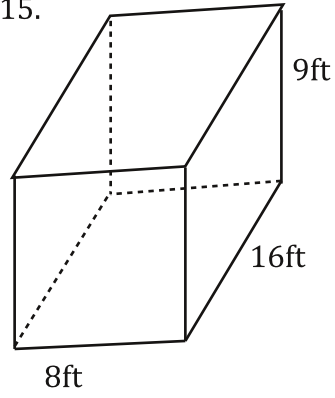
Bubble all the correct answers from above. Don't bubble incorrect answers.

- 56
 987
 1,472
 136
 1,526.81
 7.78
 124.95
 8.9
 326.92
 168

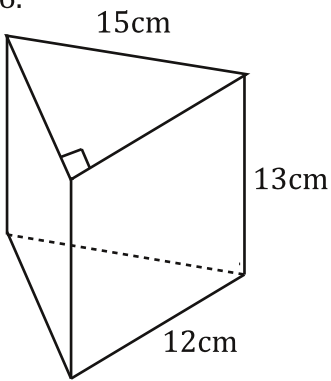
14.



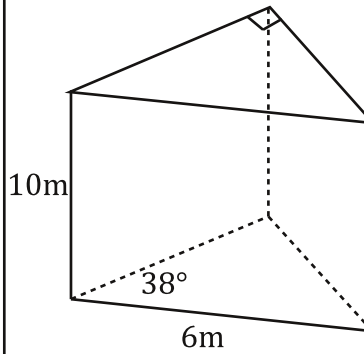
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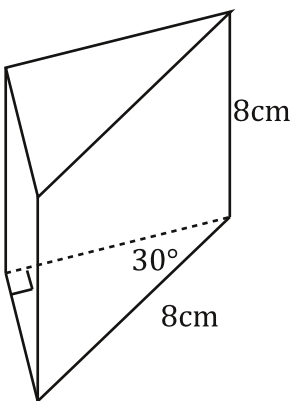
16.



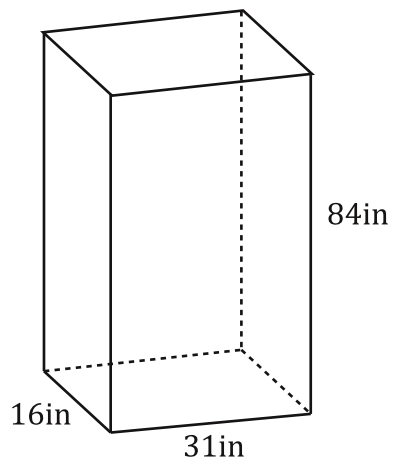
17.



19.



20.



Bubble all the correct answers from above. Don't bubble incorrect answers.

110.88

345.65

41,664

45

702

7,602.65

29,383.32

1,152

1174

87.3

Answer each question..

21. A rectangular based prism has a length of 12m a width of 7m and height of 11m. Find its volume.

23. A cylinder has a a radius of 18in and a height of 21in. Find its volume.

25. A rectangular based prism has a length of 23cm, a width of 28cm, and a height of 11m. Find its volume.

27. Find the volume of a cube that has lengths of 21in.

22. A prism has a triangle as its base. The base of the triangle is 8ft and the height of triangle is 6ft. The height of the prism is 9ft. Find its volume.

24. A prism has a pentagonal base. The area of the pentagon is 45mm^2 , the height of the prism is 13mm. Find the volume of the prism.

26. A square based prism has a square that has sides of 9yd long and is 10yd high. Find the volume of the prism.

28. A prism has a triangle as its base. The hypotenuse of the triangle is 10ft and one leg of the triangle is 6ft. The height of the prism is 7ft. Find its volume.

Bubble all the correct answers from above. Don't bubble incorrect answers.

924 216 810 214 676 585 8674 9,261 7,084 87,584.4 857 744 168 21,375.4