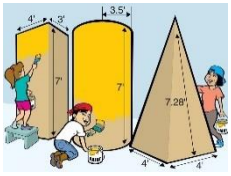
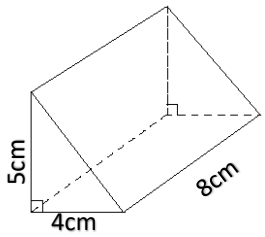
Grade 8 - Mathematics

Surface Area and Volume 4



Memo

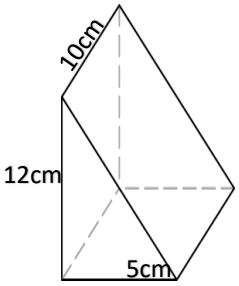
1. Calculate the volume and capacity (in l) of the following triangular prism.



V = ($\frac{1}{2}b$ x ⊥h) x H
= (½ x 4cm x 5cm) x 8cm
= 10cm² x 8cm
= 80cm³

C: 1cm³ = 1ml
80cm³ = 80ml
80ml = 0,08l

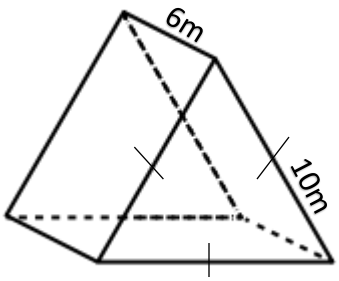
2. Calculate the volume and capacity (in ml) of the following triangular prism.



V = ($\frac{1}{2}b$ x ⊥h) x H
= (½ x 5cm x 12cm) x 10cm
= 30cm² x 10cm
= 300cm³

C: 1cm³ = 1ml
300cm³ = 300ml

3. Calculate the volume and capacity (in kl) of the following triangular prism



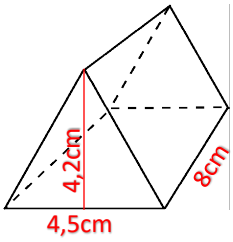
First work out the height of the Δ using pythag
$(10m)^2 = (\perp h)^2 + (½ \times 10m)^2$
$100m^2 = (\perp h)^2 + 25m^2$
$100m^2 - 25m^2 = (\perp h)^2$
$75m^2 = (\perp h)^2$
$\sqrt{75m^2} = \perp h$
$8{,}66m = \perp h$

$V = (½b \times \perp h) \times H$
$= (½ \times 10m \times 8{,}66m) \times 6m$
$= 43{,}3m^2 \times 6m$
$= 259{,}8m^3$

C: $1m^3 = 1kl$
$259{,}8m^3 = 259{,}8kl$

4. Jerry and his family sell fudge at flea markets. He designed new packaging for the fudge in the form of a triangular prism. The triangular base of the prism has a base of 4,5cm and a perpendicular height of 4,2cm. The Height of the prism is 8cm.
   a. What is the volume of this packaging?
   b. What is the capacity of this packaging in l(round off to the 2nd decimal place)?
   c. Theoretically, how many pieces of fudge could the box contain if the volume of each piece was $8cm^3$ and the fudge was in cubes?
   d. Why would this be a theoretical answer and not necessarily a practical answer?

Draw a representation:



a. V = (½b x ⊥h) x H
   = (½ x 4,5cm x 4,2cm) x 8m
   = 9,45cm² x 8cm
   = 75,6cm³

b. C: 1cm³ = 1ml
   75,6cm³ = 75,6ml
   75,6ml = 0,0756l
   0,08l

c. 75,6cm³ ÷ 8cm³
   = 9,45
   Theoretically you could fit 9 pieces of fudge in each package

d. This is theoretical because of the shape of the packaging and the shape of the fudge. There would be gaps on the side because each block of fudge is a cube.