

# Worksheet

12/06/2020

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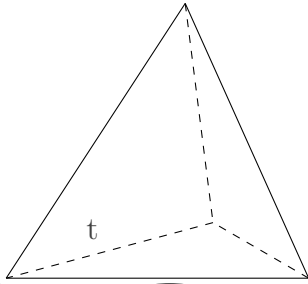
Problem quickname: 2200

1)

State the formulas for the required metrics of the given shape and calculate their approximate values.

Quick:  
2200

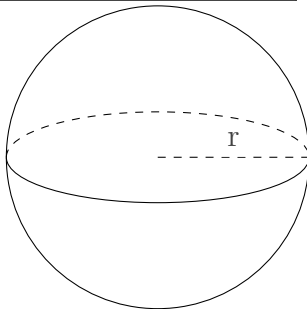
a)



This is a regular tetrahedron. All edges are of the same length with  $t = 8$ . The surface area is:

$$A = t^2 \cdot \sqrt{3} = 111. \text{ The volume is: } V = \frac{t^3}{12} \cdot \sqrt{2} = 60.$$

b)

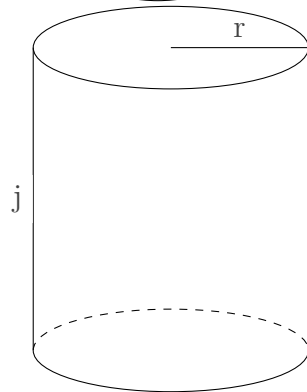


This is a sphere. We have  $r = 14$ . The surface area is:

$$A = 4 \cdot \pi \cdot r^2 = 2462. \text{ The volume is:}$$

$$V = \frac{4}{3} \cdot \pi \cdot r^3 = 11488.$$

c)

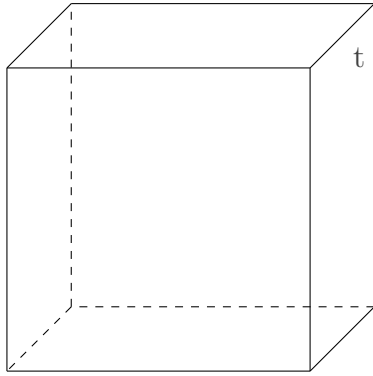


This is a cylinder. The base of this shape is formed by a circle. We have  $r = 5$ ,  $j = 11$ . The surface area is:

$$A = 2 \cdot \pi r^2 + 2 \cdot \pi \cdot r \cdot j = 502. \text{ The volume is:}$$

$$V = \pi \cdot r^2 \cdot j = 864.$$

d)



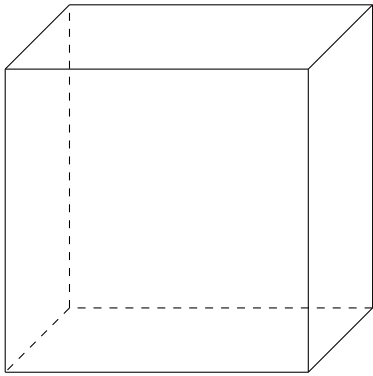
This is a cube. All edges of the shape are of the same length with  $t = 19$ . The surface area is:  
 $A = 6 \cdot t^2 = 2166$ . The volume is:  $V = t^3 = 6859$ .

2)

State the formulas for the required metrics of the given shape and calculate their approximate values.

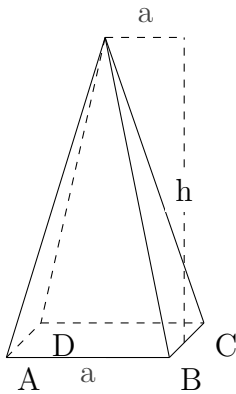
Quick:  
2200

a)



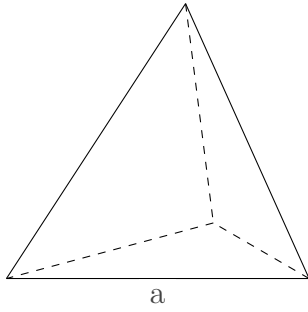
This is a cube. All edges of the shape are of the same length with  $a=24$  cm. The surface area is:  
 $A = 6 \cdot a^2 = 3456 \text{ cm}^2$ . The volume is:  $V = a^3 = 13824 \text{ cm}^3$ .

b)



This is a square pyramid. The base of this shape is formed by a square. We have  $a=7$  cm,  $h=13$  cm. The surface area is:  $A = a^2 + a \cdot \sqrt{4 \cdot h^2 + a^2} = 237 \text{ cm}^2$ .  
 The volume is:  $V = \frac{1}{3} \cdot a^2 \cdot h = 212 \text{ cm}^3$ .

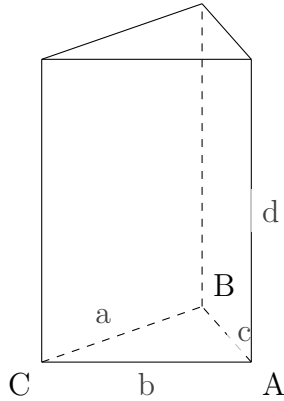
c)



This is a regular tetrahedron. All edges are of the same length with  $a=6$  mm. The surface area is:

$$A = a^2 \cdot \sqrt{3} = 62 \text{ mm}^2. \text{ The volume is: } V = \frac{a^3}{12} \cdot \sqrt{2} = 25 \text{ mm}^3.$$

d)



This is a prism. The base of this shape is formed by a triangle ABC which has an area of  $A(\text{triangle})=486$   $\text{cm}^2$ . We have  $a=27$  cm,  $b=36$  cm,  $c=45$  cm,  $d=52$  cm.

The surface area is:

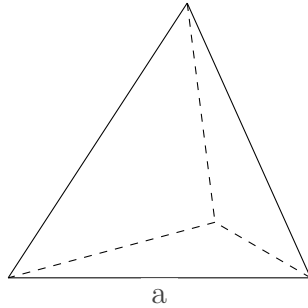
$$A = 2 \cdot A(\text{triangle}) + d \cdot (a + b + c) = 6588 \text{ cm}^2. \text{ The volume is: } V = A(\text{triangle}) \cdot d = 25272 \text{ cm}^3.$$

3)

State the formulas for the required metrics of the given shape.

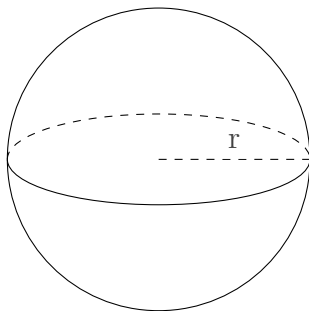
Quick:  
2200

a)



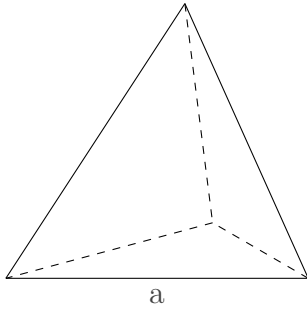
This is a regular tetrahedron. All edges are of the same length with  $a=20$  m. The volume is:  $V = \frac{a^3}{12} \cdot \sqrt{2} = 942$   $\text{m}^3$ .

b)



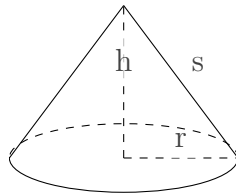
This is a sphere. We have  $r=3$  m. The surface area is:  
 $A = 4 \cdot \pi \cdot r^2 = 113 \text{ m}^2$ .

c)



This is a regular tetrahedron. All edges are of the same length with  $a=3$  m. The surface area is:  
 $A = a^2 \cdot \sqrt{3} = 15 \text{ m}^2$ .

d)



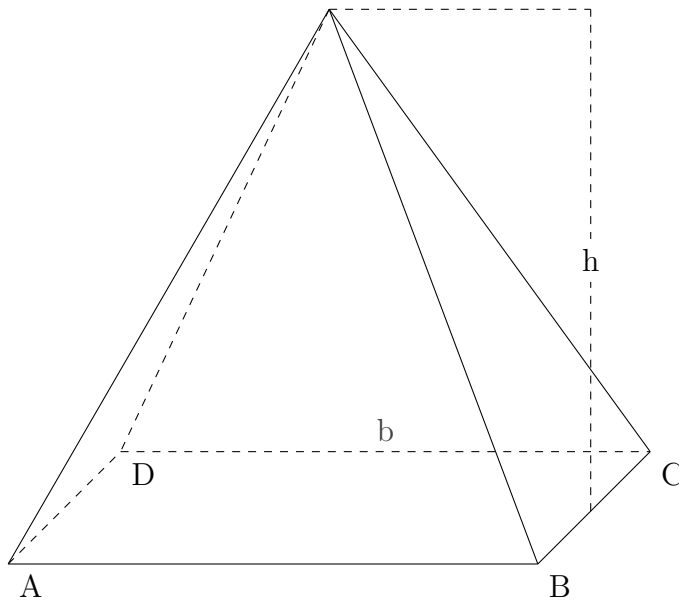
This is a cone. We have  $h=72$  m,  $s=90$  m,  $r=54$  m. The surface area is:  $A = r \cdot \pi \cdot (r + s) = 24416 \text{ m}^2$ .

4)

Calculate the approximate values of the shapes metrics a requested.

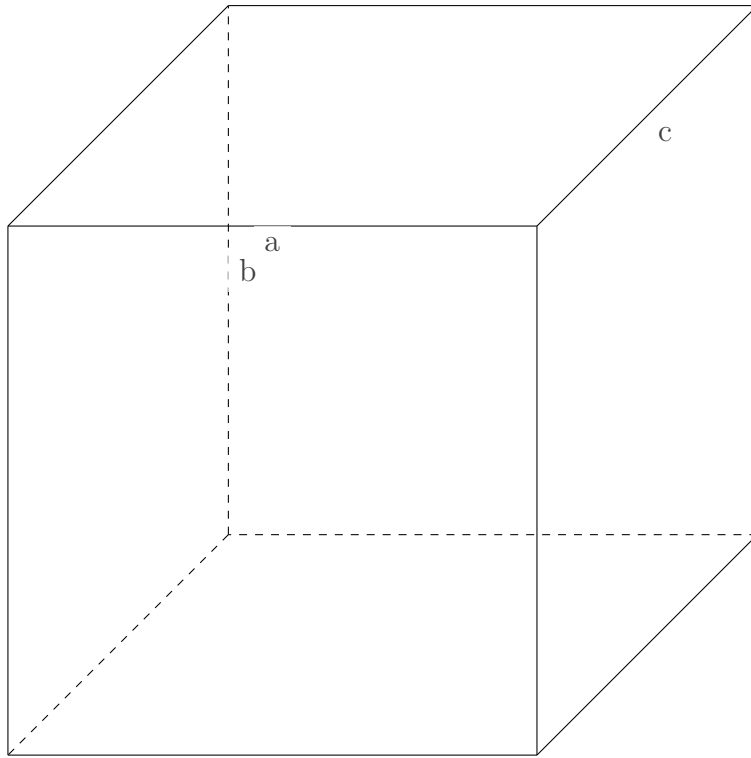
Quick:  
2200

a)



This is a square pyramid. The base of this shape is formed by a square. We have  $b = 17$ ,  $h = 16$ . The surface area is:  $A = b^2 + b \cdot \sqrt{4 \cdot h^2 + b^2} = 905$ .

b)



This is a cuboid. We have  $a = 12$ ,  $b = 12$ ,  $c = 10$ . The volume is:  
 $V = a \cdot b \cdot c = 1440$ .

Good Luck!