First name: _____ Last name: _____ Students ID: _____

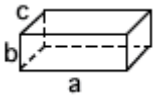
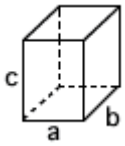
3D Geometry Homework

Basic problems

1. Fill in the missing values for a rectangular prism. Show work!

1.	2.	3.
length _____	length 5	length 4
width 2	width _____	width 13
height 7	height 7.42	height 1
surface area 100	surface area _____	surface area _____
volume _____	volume 37.1	volume _____

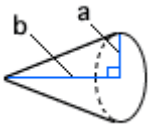
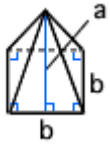
2. Find the volume of each solid in exact value. Show work!

1.	2.	3.
		
a = 1 cm	a = 31 in	a = 35 m
b = 55 cm	b = 10.7 in	b = 36 m
	c = 19.6 in	c = 77 m

3. Find the volume of each solid in exact value. Show work!

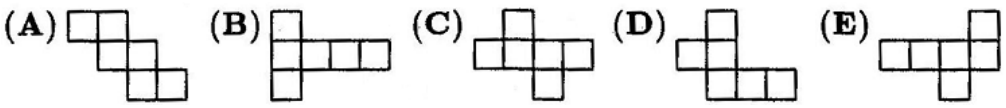
1. triangular prism: B = 29 ft^2, h = 15 ft	2. sphere: d = 2 km

4. Find the surface area of each solid in exact value. Show work!

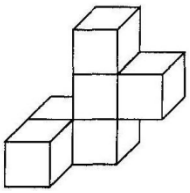
1.  a = 12 cm	2.  a = 1 mm b = 11 mm	3.  a = 3 in b = 7 in c = 7 in

Challenge problems

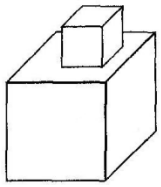
1. Which pattern of identical squares could NOT be folded along the lines shown to form a cube?



2. Six cubes, each an inch on an edge, are fastened together, as shown. Find the total surface area in square inches. Include the top, bottom and sides.



3. A cube has edge length 2. Suppose that we glue a cube of edge length 1 on top of the big cube so that one of its faces rests entirely on the top face of the larger cube. What is the percent increase in the surface area (sides, top, and bottom) from the original cube to the new solid formed?



4. Figure 1 is called a "stack map." The numbers tell how many cubes are stacked in each position. Fig. 2 shows these cubes, and Fig. 3 shows the view of the stacked cubes as seen from the front. Which of the following is the front view for the stack map in Fig. 4?

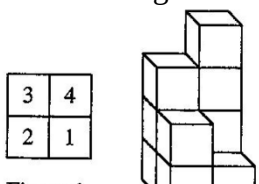


Figure 1

Figure 2

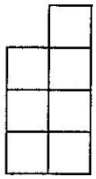


Figure 3

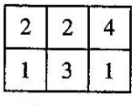
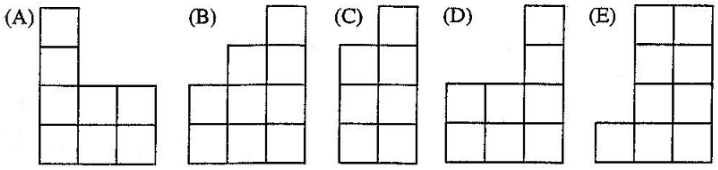
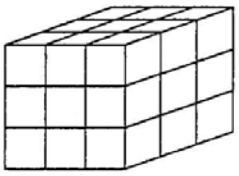


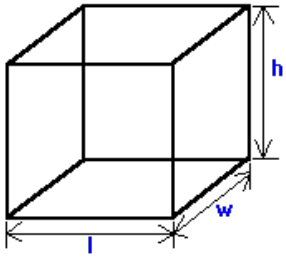
Figure 4



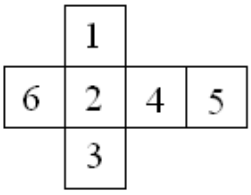
5. Each corner cube is removed from this 3 cm x 3 cm x 3 cm cube. What is the surface area of the remaining figure?



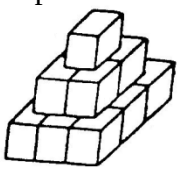
6. A cereal company decided to increase the height of its boxes by 30 percent and reduce the width in order to maintain the same volume. If initially, length = 20cm, height = 40cm, width = 30cm. What will the new height and width be if length stays the same?



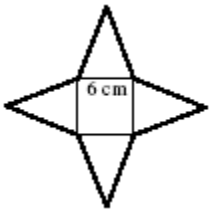
7. The figure may be folded along the lines shown to form a number cube. Three number faces come together at each corner of the cube. What is the largest sum of three numbers whose faces come together at a comer?



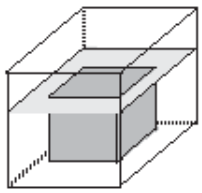
8. An artist has 14 cubes, each with an edge of 1 meter. She stands them on the ground to from a sculpture as shown. She then paints the exposed surface of the sculpture. How many square meters does she paint?



9. Four identical isosceles triangles border a square of side 6 cm, as shown. When the four triangles are folded up they meet at a point to form a pyramid with a square base. If the height of this pyramid is 4 cm, what is the total area of the four triangles and the square?



10. A container in the shape of a cube has edge length 20 cm and contains some water. A solid gold cube, with edge length 15 cm, sinks to the bottom of this container, causing the water level to rise just to the top of the *solid* cube. What is the original depth of the water?



11. Air is pumped into a vacuum sealed (picture below) room at a rate of 2 litres per minute. How many seconds does it take to fill the room with air? Use the information given to find the volume of the room.

a = 3dm (1 mL = 1 cm^3), b = 3dm (1000 mL = 1L),
c = 4dm (1000 cm^3 = 1 dm^3 = 1L)
d = 5dm, e = (3a - 1)dm, f = (1/2b)dm, g = (3/8a + 3/8b)dm