

## 3D Geometry

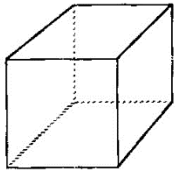
### Notes

- Net Diagrams of 3-Dimensional Shapes

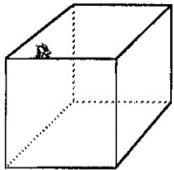
- 3-Dimensional Pythagorean Theorem

### Discussion Questions

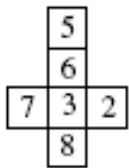
1. What is the shortest distance to travel from one corner of a  $7\text{cm} \times 7\text{cm} \times 7\text{cm}$  cube to its opposite corner through the interior of the cube?



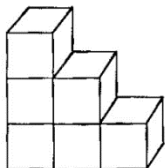
2. A fly is walking along the edges of a  $11\text{cm} \times 11\text{cm} \times 11\text{cm}$  cube. The fly never walks along any edge more than once. What is the *greatest* distance, in centimeters, that the fly can walk?



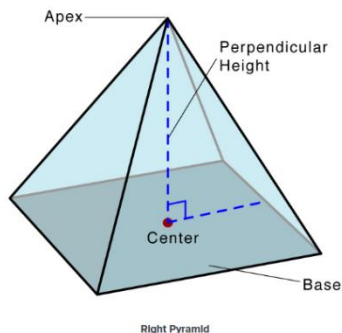
3. The figure shown is folded to form a cube. Three faces meet at each corner. If the numbers on the three faces at a corner are multiplied, what is the *largest* possible product?



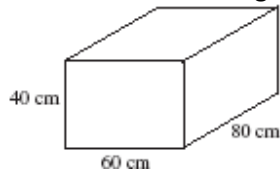
4. A base row of blocks is formed, and rows of blocks are added so that each new row has one fewer block than the row below it. If the base has ninety-nine blocks and the final row has one block, what is the total number of blocks used?



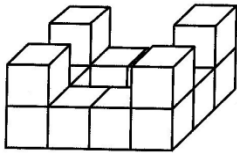
5. A square-based right pyramid has dimensions 6 cm by 6 cm by 18 cm. A rectangular box has volume one-half of the pyramid and has a base 9 cm by 3 cm. What is the surface area of the rectangular box?



7. What is the maximum number of rectangular wooden blocks with dimensions  $20\text{ cm} \times 30\text{ cm} \times 40\text{ cm}$  that could fit into a rectangular box with inner dimensions  $40\text{ cm} \times 60\text{ cm} \times 80\text{ cm}$ ?

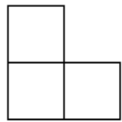


8. Fourteen white cubes are put together to form the figure below. The complete surface of the figure, including the bottom, is painted red. The figure is then separated into individual cubes. How many of the individual cubes have exactly four red faces?

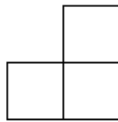


### Practice Questions

9. A figure is constructed from unit cubes. Each cube shares at least one face with another cube. What is the minimum number of cubes needed to build a figure with the front and side views shown?

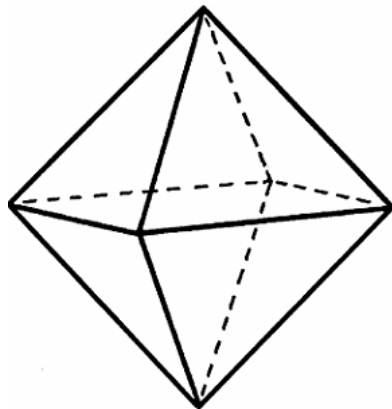


front



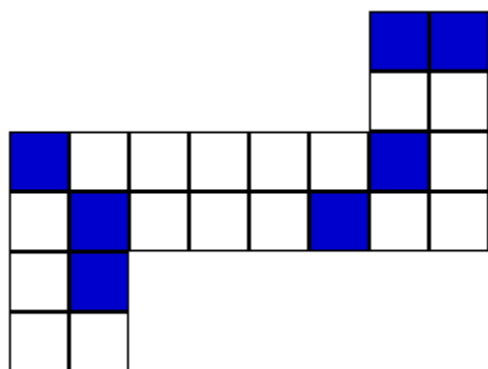
side

10. Draw three possible net diagrams for the 3-D shape shown below. This 3-D solid is made of 8 *congruent* equilateral triangular faces.

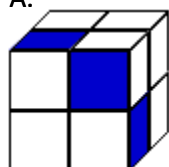


*Note: two shapes are congruent if they have exactly the same shape and same size.*

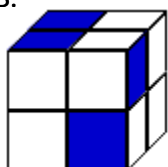
11. Which of the following cubes can be made from the net shown below?



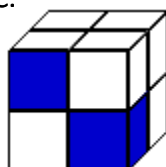
A.



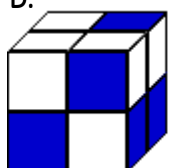
B.



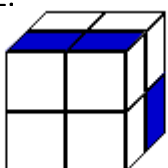
C.



D.



E.



F.

