

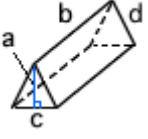

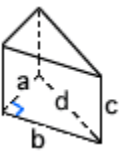

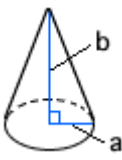
First name: _____ Last name: _____

Student ID: _____

Geometry

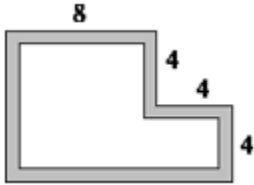
Basic problems

1. Leave the answers in exact values in terms of π where necessary. Show work!

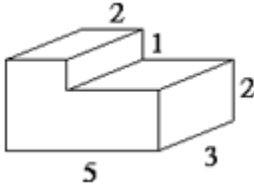
<p>1.</p>  <p>Note: Isosceles triangle</p> <p>$a = 8mm$ $b = 40mm$ $c = 12mm$ $d = 10mm$</p>	Surface area	Volume
<p>2.</p>  <p>$a = 12in$ $b = 20in$</p>	Surface area	Volume
<p>3.</p>  <p>$a = 8cm$ $b = 15cm$ $c = 10cm$</p>	Surface area	Volume
<p>4.</p>  <p>$a = 20mm$</p>	Surface area	Volume
<p>5.</p>  <p>$a = 8mm$ $b = 15mm$</p>	Surface area	Volume

Challenge problems

1. If the shaded region has a constant width of 1 unit, what is the difference between the areas of the non-shaded region and the shaded region?

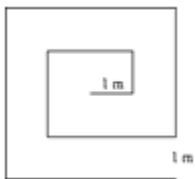


2. What is the volume of the solid figure shown?

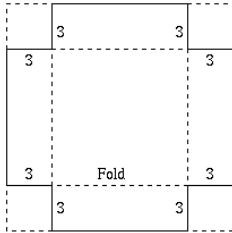


3. The faces of a cube are marked with the numbers 1, 2, 3, 4, 5, 6. Each corner of the cube is assigned “vertex number” equal to the sum of all the numbers on the faces that meet at this corner. What is the sum of all the vertex numbers?

4. A path which is 1 m wide is partly surrounded by a fence shown in the diagram at the right. What is the length of the fence?



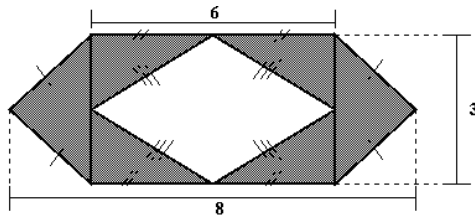
5. A company is designing a package for its product. One part of the package is to be an open box made from a square piece of aluminum by cutting out a 3 cm square from each corner and folding up the sides (see Figure). The box is to contain 75 cm^3 . What are the dimensions in $\text{cm} \times \text{cm}$ of the square piece of aluminum that must be used?



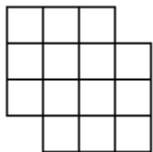
6. What is the surface area in cm^2 of the solid figure shown if the cubes measure 1 cm on each side?



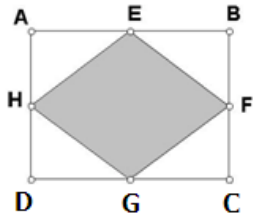
7. What is the area of the shaded region? Line segments that are marked with the same symbol are equal in length.



8. How many different squares are there in the figure shown?

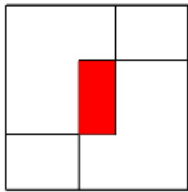


9. The area of rectangle ABCD is 12 m^2 . E, F, G and H are the midpoints of the sides of rectangle ABCD. What is the area of the quadrilateral EFGH?



10. The length, L , of a rectangle is increased by 50% and the width, W , is doubled to form a larger rectangle with an area of 30 cm^2 . What is the largest possible perimeter of the larger rectangle if L and W are integers with $L > W$?

11. Two identical pieces of paper with dimensions of seven by six are placed in the corners of a square of side length equal 10 as shown in the diagram. What is the area of the shaded region? The longer side of each sheet of paper is parallel to the vertical sides of the square.



12. The figure below is made up of two parts: a rectangle with short sides of length 1 and an isosceles triangle. The base of the triangle forms one of the long sides of the rectangle. The area of the triangle is half the area of the rectangle. What is the vertical height of the triangle?

