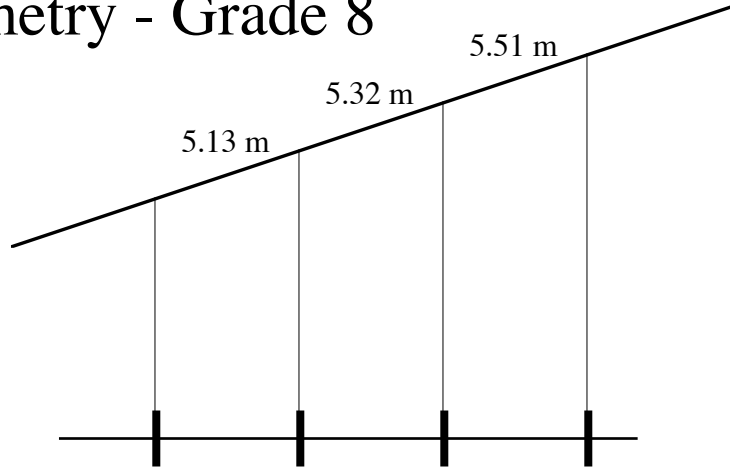


2002 Washington State Math Championship

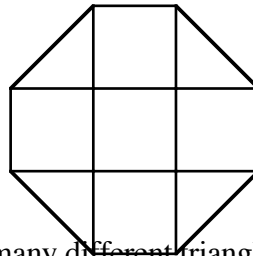
Unless a particular problem directs otherwise, give an exact answer or one rounded to the nearest thousandth.

Geometry - Grade 8

1. A freeway overpass in Canada has signs which give the maximum height in meters of vehicles which can pass underneath in each particular lane. The freeway itself is level, and the slope of the overpass is $\frac{1}{20}$. Each lane of the freeway has the same width. How many meters wide is each lane?

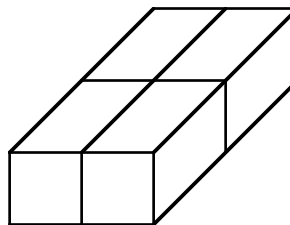


2. An extra-large jigsaw puzzle is a 2 x 3 foot rectangle when assembled. It has 48 pieces. The average area of a puzzle piece is how many square inches?
3. The meteorite that caused the extinction of the dinosaurs was approximately spherical in shape with a radius of 3.1 miles. If its density was 200 lb. per cubic foot, how many tons did it weigh? Answer in scientific notation.
4. The vertices of 5 squares are connected to form an octagon. If the side length of each square is 5, to the nearest tenth, what is the perimeter of the octagon?

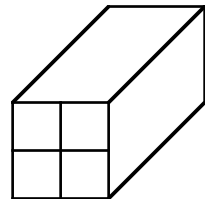


5. For the side lengths: 2, 3, 4, 5, 6, 7, 8 how many different triangles can be formed if each side length is used only once to form a triangle? For example, sides of 3, 5, and 7 can form a triangle.

6. In Washington a pound of butter is often packaged as 4 square prisms, arranged as shown below. In the Midwest butter is also packaged as 4 square prisms, but these prisms are arranged to form another square prism as shown below. The shortest dimension of a pound of Midwestern butter is $2\frac{1}{2}$ inches, and its longest dimension is double that. If the shortest dimension of a pound of Washington butter is $1\frac{9}{16}$ inches, how many inches is its longest dimension?

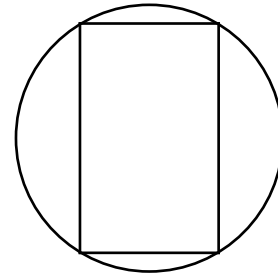


Pound of Washington butter

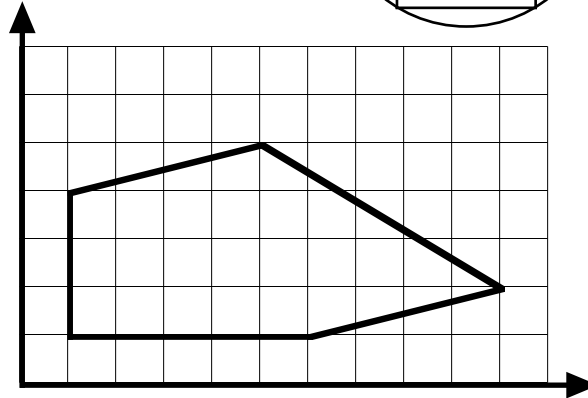


Pound of Midwestern butter

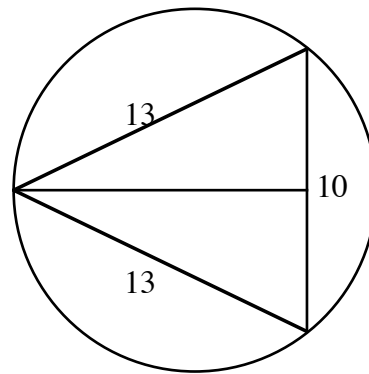
7. The ratio of the adjacent sides of the rectangle is $\frac{1}{2}$. The diameter of the circle is 10. What is the area of the rectangle?



8. A pentagon has vertices $(1, 1)$, $(1, 4)$, $(5, 5)$, $(10, 2)$, $(6, 1)$. One vertex can be changed by one in the x - direction and one in the y - direction so that the figure becomes a quadrilateral with an area of exactly 25.5. What are the new coordinates of the changed point?



9. An isosceles triangle with 2 sides of 13 and a third side of 10 is inscribed in a circle. As a mixed number what is the radius of the circle?



10. HEPTAGO is a star polygon with its 7 vertices equally spaced around a circle. If Sam walks along the sides of the star polygon and turns at each vertex, how many degrees will she turn in coming back to her original position?

