

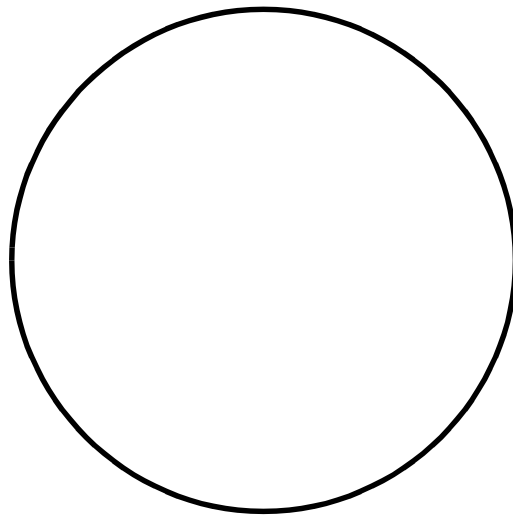
Show all relevant work. If the provided space is insufficient, then attach additional worksheets to the exam.

Construction tools means: straight edge and compass. For any problem which requires using construction tools you will need to given written directions (notes) and explicitly display the appropriate construction marks so that a reader will be able to reproduce your construction following those directions and using those marks.

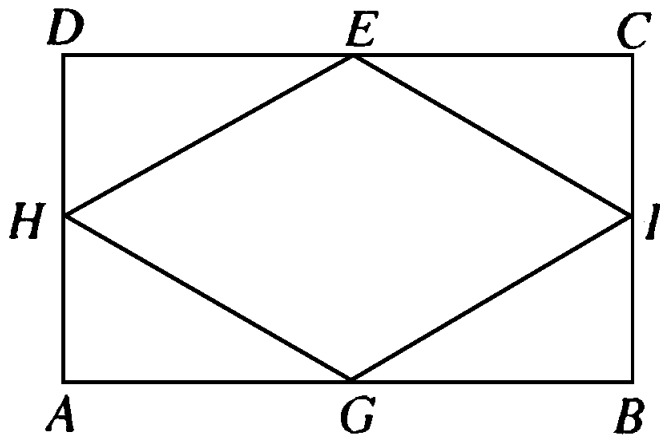
The format for this exam is collaborative. Each of you will submit a completed exam. You may consult, i.e., collaborate, with other members of your group. You may not verbatim copy the work and/or results from another member of your group. Your grade will be based on the work you submit.

Part I. Do (any) five of the following problems.

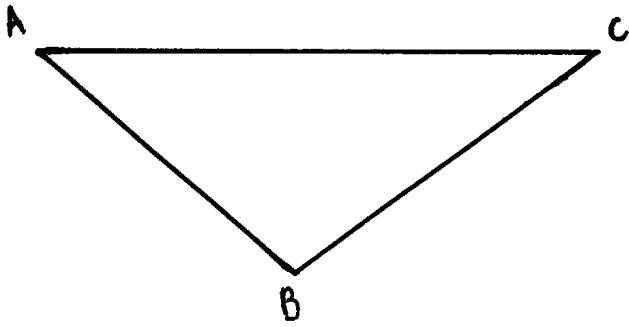
1. Use construction tools to find the center of the following circle  $C$ .



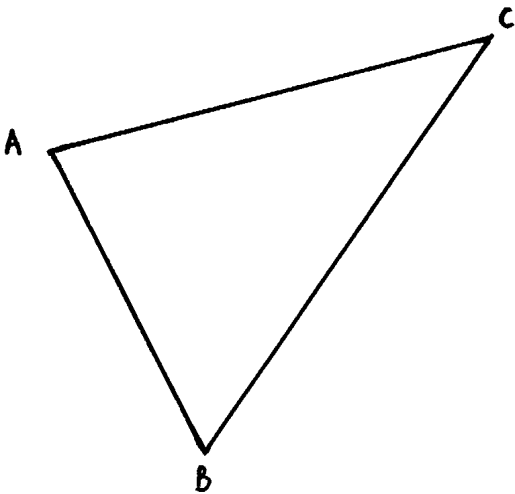
2. Consider the rectangle  $ABCD$ . The vertices of the quadrilateral  $EFGH$  are the midpoints of the sides of  $ABCD$ . What kind of figure is  $EFGH$ ? Prove your answer.



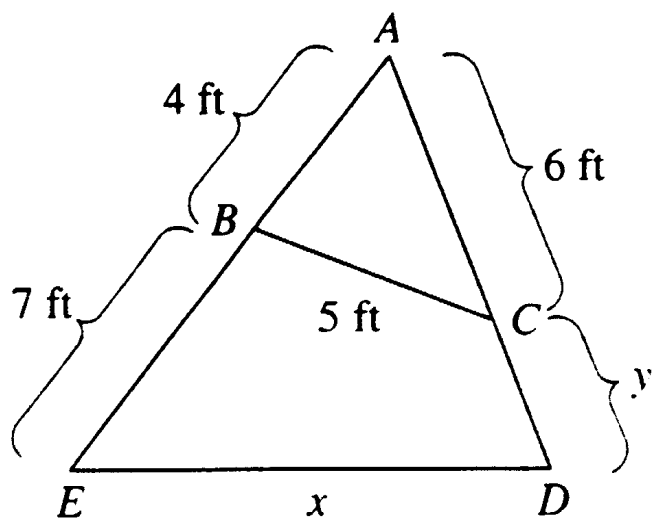
3. Use construction tools to make a triangle  $\triangle A'B'C'$  such that  $\overline{A'B'} \cong \overline{AB}$ ,  $\overline{B'C'} \cong \overline{BC}$  and  $m(\angle B') = \frac{1}{2}m(\angle B)$ .



4. Use construction tools to make a rectangle  $A'B'C'D'$  such that  $\overline{A'B'} \cong \overline{AB}$ ,  $\overline{B'C'} \cong \overline{BC}$ .

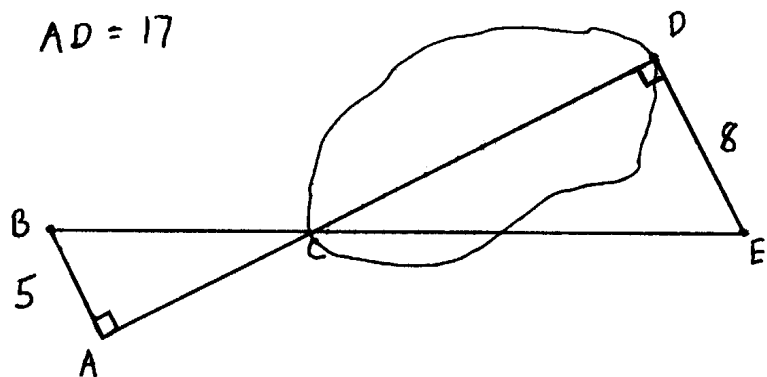


5. Consider the following figure. Find length  $x$ .



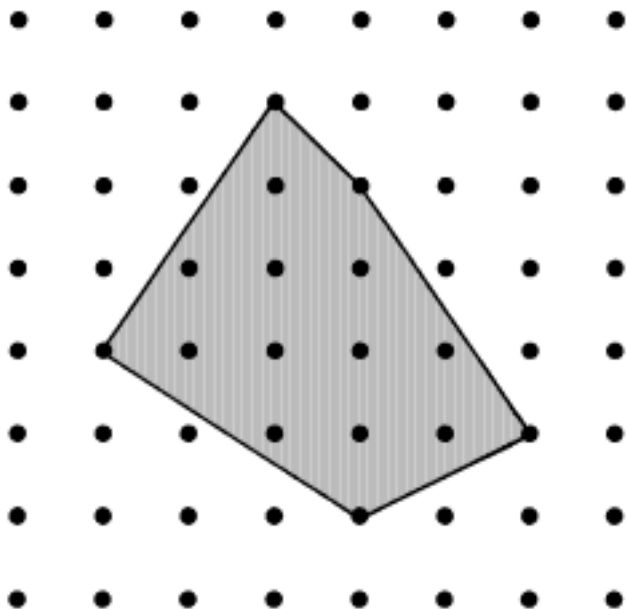
Given:  $\angle ABC \cong \angle ADE$

6. Find the width  $CD$  of the lake in the following diagram.

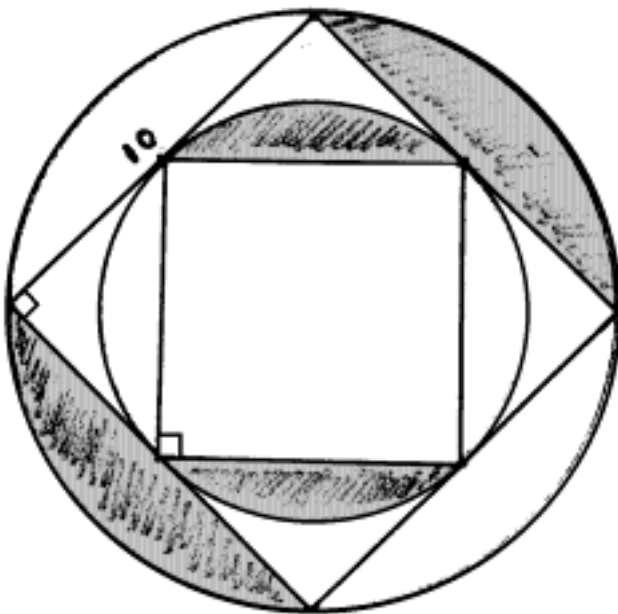


Part II. Do (any) five of the following problems.

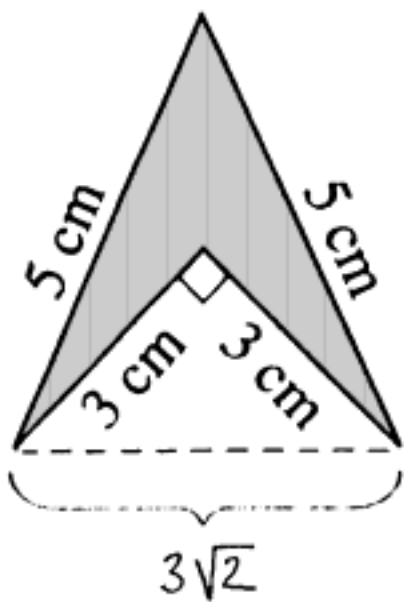
1. Find the area of the shaded figure on the geoboard, where the lattice spacing of the nodes is 1 cm.



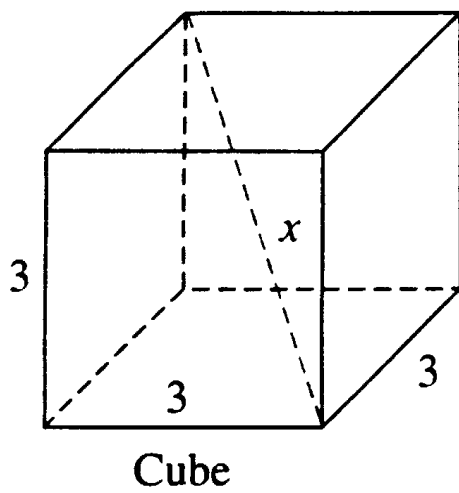
2. Find the area of the shaded figure, where all of the components of the boundary are either arcs of circle or line segments.



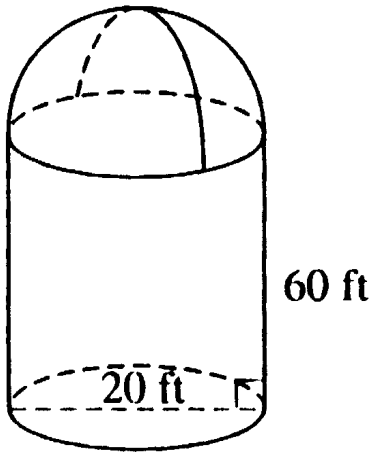
3. Find the area of the shaded figure.



4. Find the length of a diagonal of a cube whose side length is 3 cm.



5. Find the surface area (total of base, lateral sides and top) and the volume of the silo pictured below.



6. Doug's Dog Food Company wants to impress the public with the magnitude of the company's growth. Sales of Doug's Dog Food doubled from 1994 to 1995, so the company is displaying the following graphic, which shows the radius of the base and height of the 1995 can to be double those of the 1994 dog food can. What does the graphic really show with respect to the company's growth?

