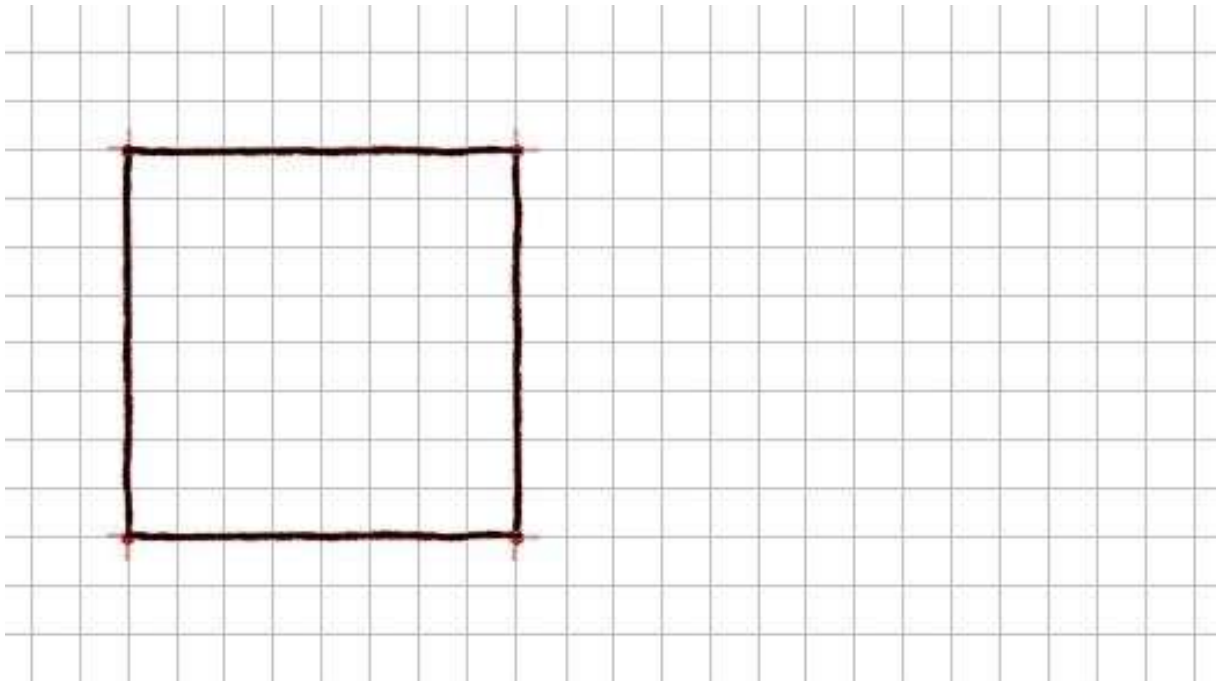

Homework: 5.1 Calculating Properties of Shapes

Procedure

Name: _____

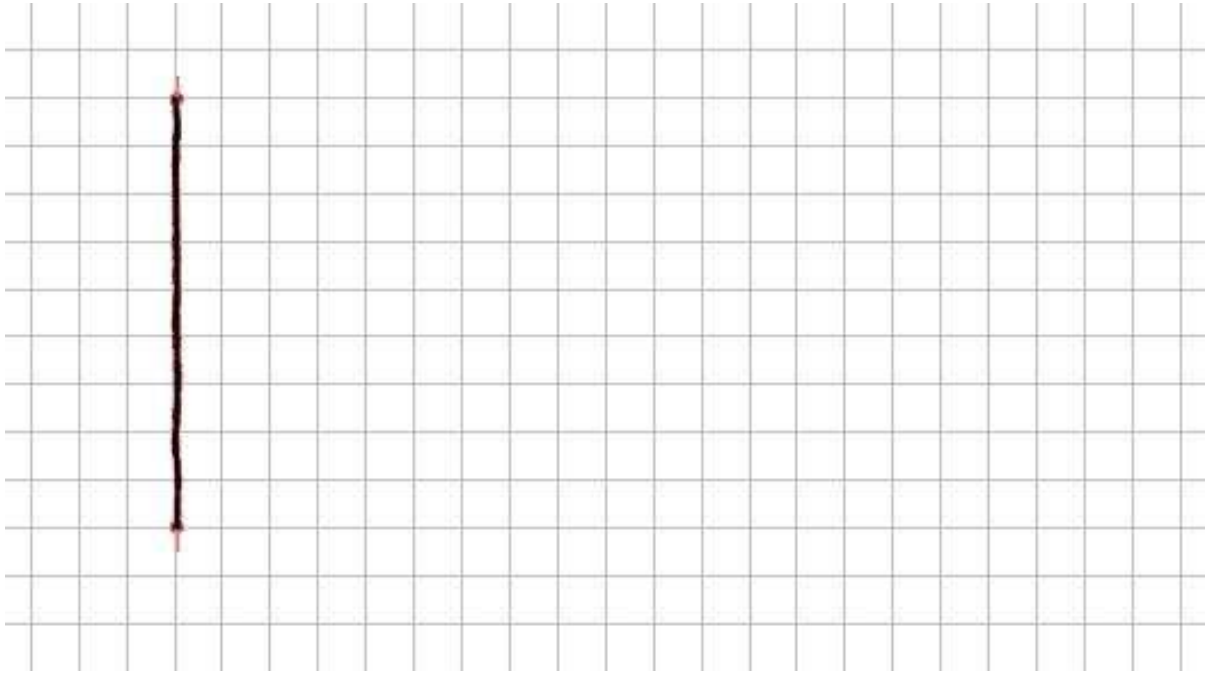
Using the presentation on the website, SW complete this activity and broaden your knowledge of shapes and your ability to sketch them. You will also learn how to calculate the dimensions and area of a shape. Use points, construction lines, and object lines to sketch the shapes described in the first seven word problems. Use the notes contained in your engineering notebook to help you perform the necessary calculations. Calculator use is encouraged, but you must show all of your work.

1. Use the sketch below to calculate the area of the square. Add all linear dimensions to the sketch that were used in the calculations. Note: each grid unit = 1 inch.

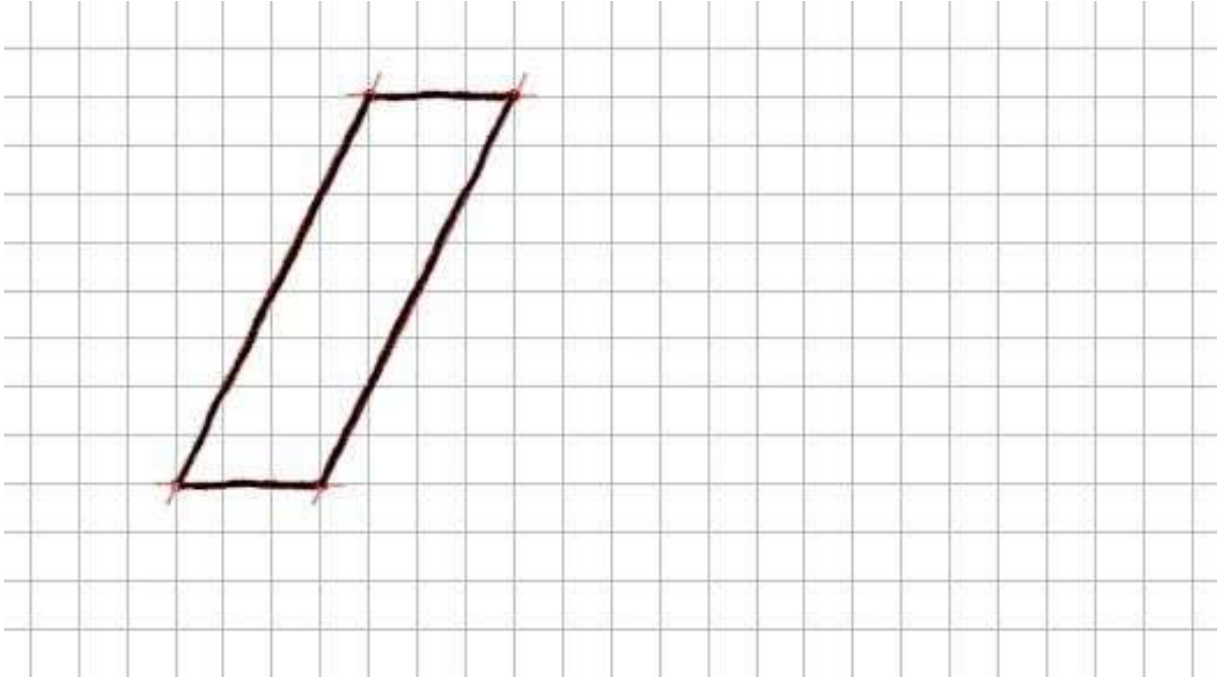


2. The area of the square represented above is revised to be 90.25 in.^2 . Note that the original grid spacing no longer applies.
 - a. What is the side length of the square?
 - b. Using this length, what is the corresponding grid spacing for the sketch?

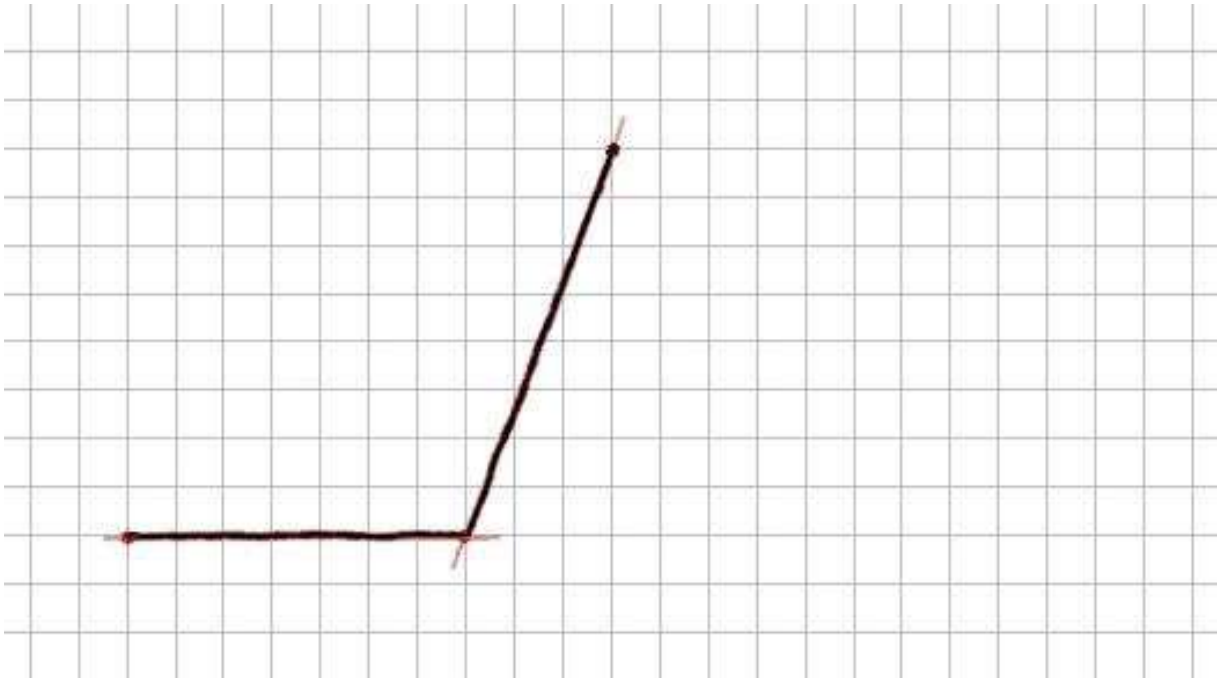
3. Complete the sketch of the rectangle. It must have an area of 2.25 in.^2 . Prove the geometry by dimensioning the sketch and showing the area calculation. Show only those dimensions needed for the area calculation. Note: each grid unit = $.25 \text{ inch}$.



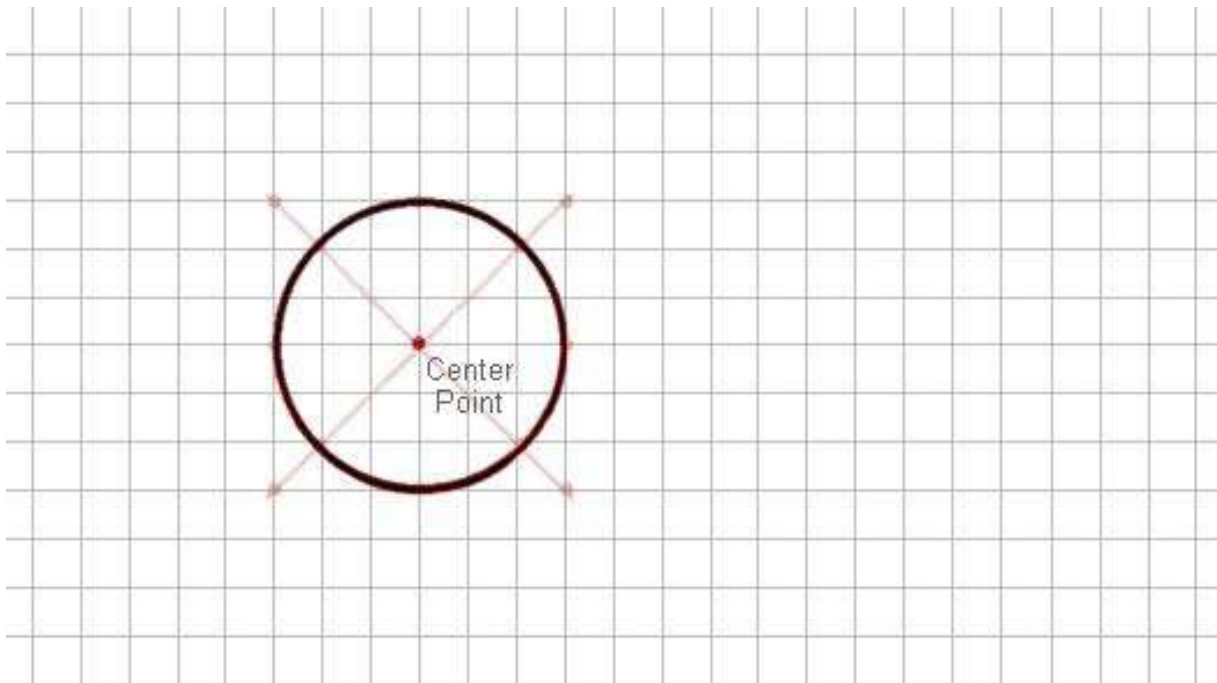
4. Use the sketch below to calculate the area of the rhomboid. Add linear dimensions to the sketch that were used in the area calculation. Note: each grid unit = 1 inch.



5. Complete the sketch of the obtuse triangle. It must have an area of 1.75 in.^2 . Prove the geometry by dimensioning the sketch and showing the area calculation. Show only those dimensions needed for the area calculation. Note: each grid unit = $.25 \text{ inch}$.

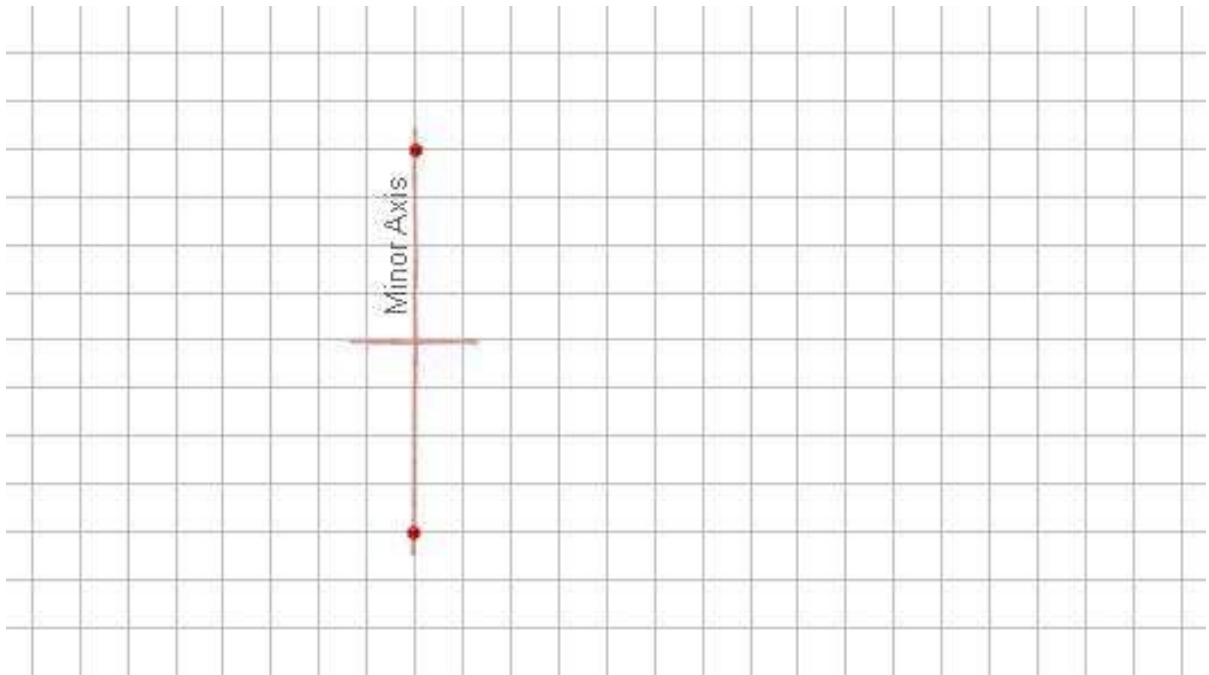


6. Use the sketch below to calculate the area of the circle. Add any dimensions to the sketch that were used to calculate the area. Note: each grid unit = .25 inch.

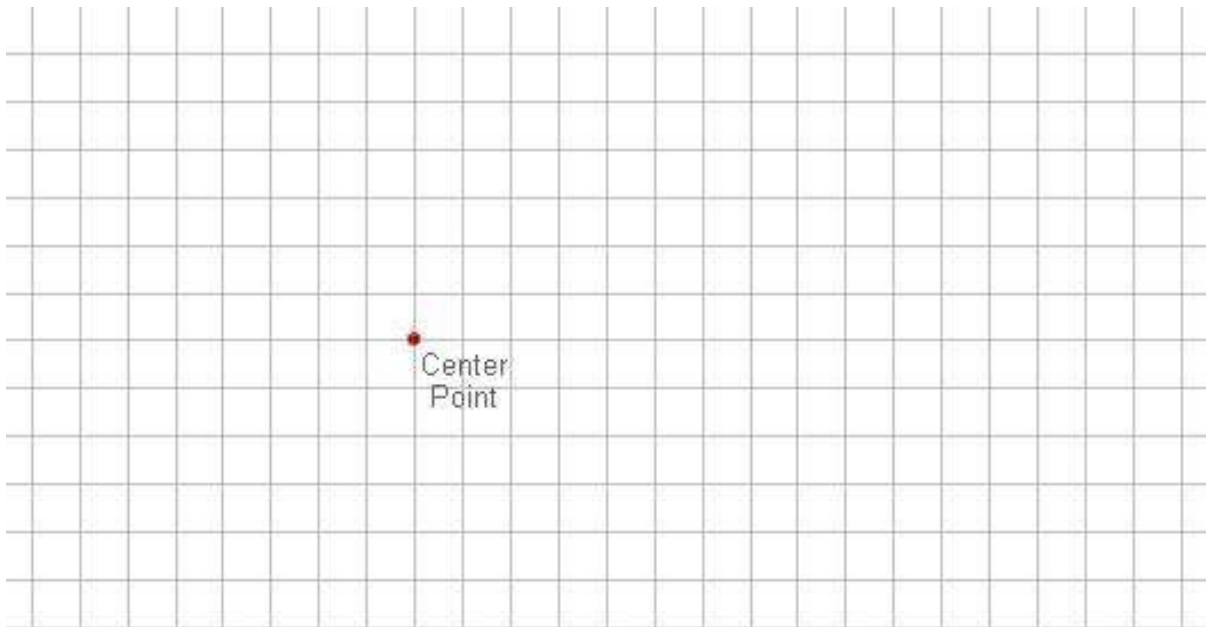


7. The area of the circle represented above is revised to be 15.90 in.^2 . Note that the original grid spacing no longer applies.
- What is the radius of the circle?
 - Using this length, what is the corresponding grid spacing for the sketch?

8. An ellipse has an area of 4.71 in.^2 and a minor axis that is 2 in. long. Solve for the major axis, and then sketch the ellipse using that dimension. Show only those dimensions needed for the area calculation. Note: each grid unit = .25 inch.



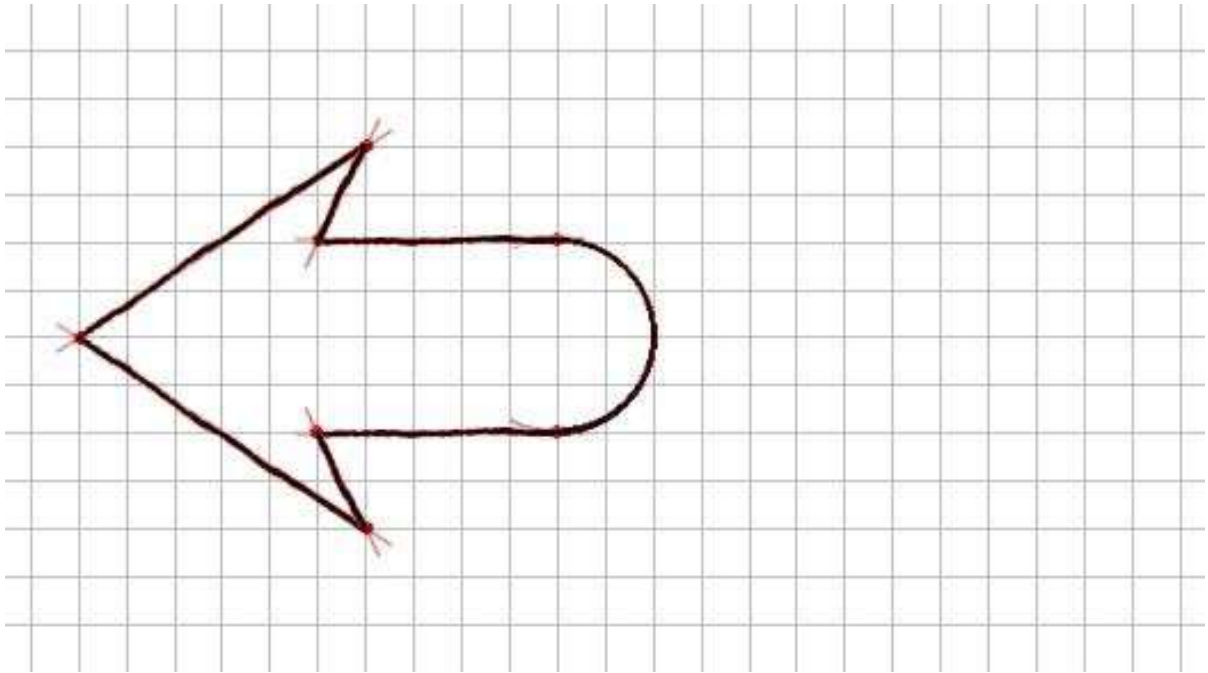
9. A regular octagon has sides that measure 4 in. Sketch the octagon on the grid below assuming a grid spacing of 1 in., and calculate the area. Check the reasonableness of your answer by estimating the area - count the number of one square inch square units enclosed by the shape.



Extending your Learning

10. The sketch shown below is for a commercial sign. It was drawn to $\frac{1}{10}$ of its true size.

What is the area of the actual sign? Prove your answer by showing all calculations. Note: each grid unit = 1 inch.



Conclusion

1. What is the difference between a circle and an ellipse?
2. What is the difference between an inscribed and a circumscribed shape?
3. Why is it impossible for a triangle to contain a 180° angle?
4. How is a rhombus similar to a square?

5. What is the difference between a right, acute, and obtuse triangle?