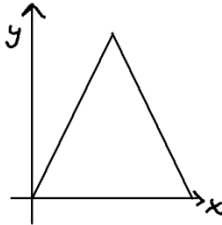# Section 4.3: Applications to Computer Graphics

Exercises

1. Consider the triangle in the diagram below. If the base is 3 units long and the two sloping sides are each 5 units long, calculate the coordinates of each vertex (corner).

2. Use the same diagram as question 1, above. If the coordinates of the three vertices are (0,0), (3,0) and (1.8, 3.5), calculate the lengths of the three sides and the sizes of the three angles and mark them in the appropriate places on the diagram.

3. A Crayola crayon manufacturer wants to make a sign in the form of a crayon, as shown in the diagram below. The rectangle is 4 units long and 2 units wide. The vertical side of the triangle is also 2 units long, while the other two sides are both 3 units long. Calculate the coordinates of the pointed end of the crayon and the angle θ in the diagram.
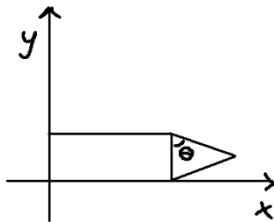

4. Suppose you wanted to make a sign in the shape of a tree, as shown below. The trunk is a square of side 2 units, while the base of the triangle is 6 units long. If the triangle is isosceles (the two sloped sides are equal in length) and the angle between the horizontal base and one of the sloped sides is 65°, what are the coordinates of the three vertices of the triangle?
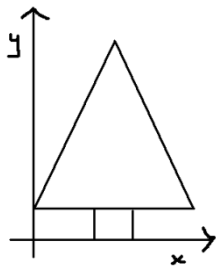

5. A pendant in the shape of a square is shown below. If the centre of the circle to be drilled in the pendent is 1 unit below the top of the pendent and the pendent has side

of length 5 units, how far is the centre of the circle from the bottom point of the pendant?
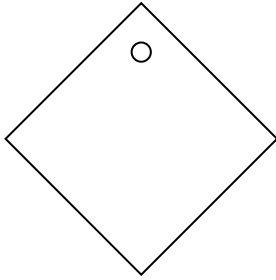
6. A computer graphic in the shape of a heart is shown below. It consists of two semicircles and a square. If the square has side of length 12 and the origin is placed at the bottom of the square, what are the coordinates of the centres of the two semicircles?
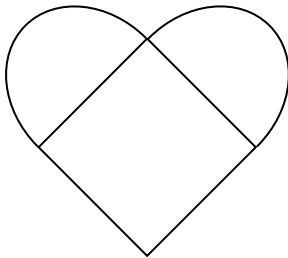
7. (tricksy) An equilateral triangle is inscribed inside a circle, as shown below. If the triangle has a side of length 2 units, calculate the radius of the circle.