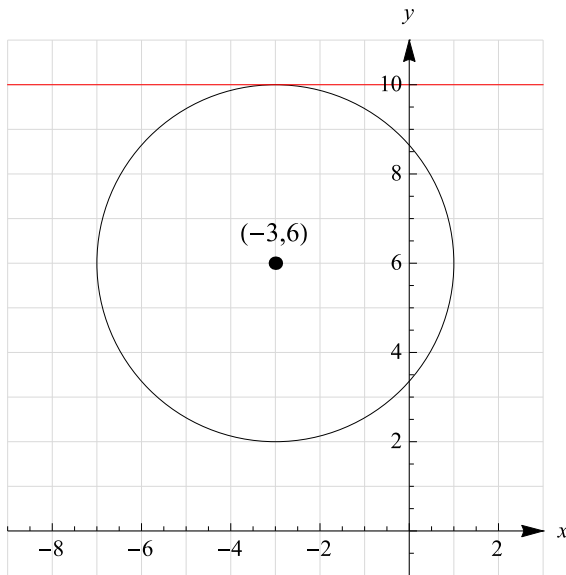# Handout 4: Going Around in Circles
Answers

Figure 1

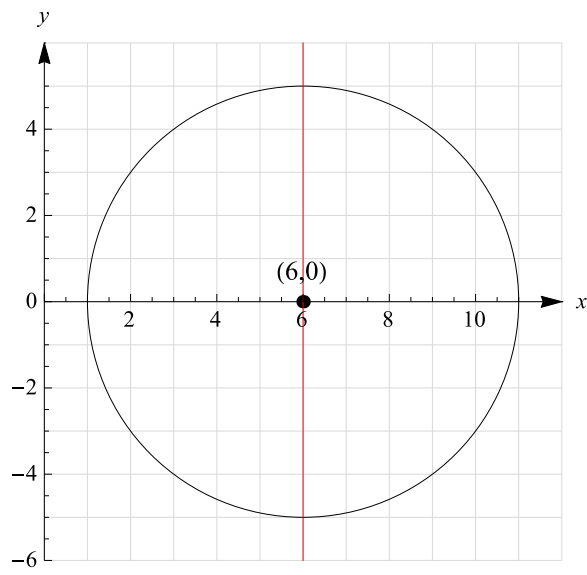

Figure 2

In questions 1 and 2, give an equation for the circle with the given characteristics.

1. Center $(6, 34)$ and radius 4 km.

   $(x - 6)^2 + (y - 34)^2 = 16.$

2. Center $(-2, 4)$ and diameter 100 m.

   $(x + 2)^2 + (y - 4)^2 = 2500.$

In questions 3 and 4, give the center and radius of the circle with the given equation.

3. $(x - 5)^2 + (y + 9)^2 = 36$

   $(5, -9)$; radius: 6.

4. $4 \times (y - 1)^2 = 100 - 4 \times (x + 10)^2$

   Center: $(-10, 1)$; radius: 5.

In questions 5 and 6, refer to the following information. Fort Shmoop is situated in the middle of a broad, flat, featureless plain in the middle of the Nevada desert. A lookout is stationed at a spot 7 km north and 4 km west of Fort Shmoop. The lookout can see for 10 km in any direction.

5. On a coordinate system where Fort Shmoop is at $(0,0)$ and north is up, given an equation for the maximum extent of the lookout's vision. (That is, given an equation for the curve that marks the boundary between what the lookout can see and what he can't see.)

   $(x + 4)^2 + (y - 7)^2 = 100.$

6. One Tuesday, the lookout claimed that he saw a UFO land at a point he estimated to be 15 km north and 11 km west of Fort Shmoop. If he stayed at his post all day as he was supposed to, is it possible that he could have seen that UFO and been correct in his estimate of where it was?

No.

7. Plot the circle with equation $(x + 3)^2 + (y - 6)^2 = 16$ in Figure 1.

8. Draw a line tangent to the circle in question 7 and give an equation for your tangent line. (Hint: some tangents will be easier to deal with than others.)

Many possible answers; suggested: $y = 10$.

9. Plot the circle with equation $(x - 6)^2 + y^2 = 25$ in Figure 2.

10. Draw a secant of the circle in question 9 and give an equation for your secant. Hint: some secants will be easier to deal with than others.

Many possible answers; suggested: $x = 6$.