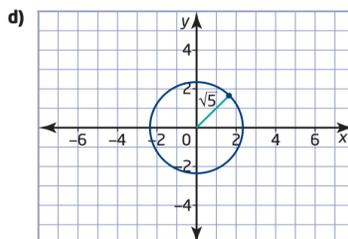# Equation of a Circle with Centre (0, 0)

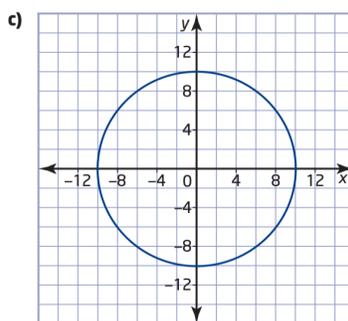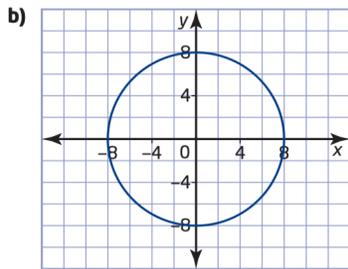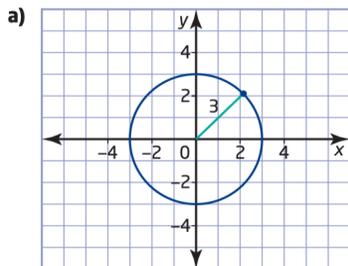*For each question, complete your answers on a separate sheet of lined paper or graph paper.*

Then, check your solutions against the final answers on the next page.

As needed, we will take up full solutions in our next class together.

Questions

1. Determine an equation for each circle.

a)

b)

c)

d)

3. For each point, find an equation for the circle that is centred at the origin and passes through the point.

a) $(-4, 3)$ **b)** $(5, 2)$

c) $(-3, -6)$

4. Determine whether each point is on, inside, or outside the circle defined by $x^2 + y^2 = 34$.

**a)** $(5, -3)$ **b)** $(4, 4)$

c) $(-6, 0)$

5. A satellite orbits Earth on a circular path with equation $x^2 + y^2 = 1.44 \times 10^8$, with distances measured in kilometres. Another satellite orbiting in the same plane passes through the point (8000, 9800). Is this satellite inside the orbit of the first one?

6. Determine an equation for the circle that has a diameter with endpoints A$(-4, 3)$ and B$(4, -3)$.

**8.** A farmer is building a circular corral to hold livestock. With distances measured in metres, the shape of the corral is modelled by the equation $x^2 + y^2 = 64$.

a) Find the length of fencing required for this corral.

b) Find the area of the corral.

15. As part of the North American Free Trade Agreement (NAFTA), Canada, the United States, and Mexico are developing joint standards for highway trucks. One standard specifies a maximum width of 2.60 m and a maximum height of 4.15 m. Will a truck of this size fit through a semicircular tunnel with a maximum height of 4.50 m?

4.50 m
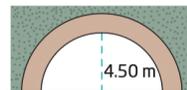
19. An equation for the small circle in this design is $x^2 + y^2 = 4$. Determine an equation for the larger circle.
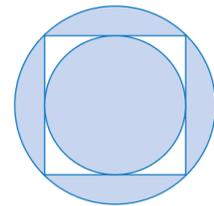
Answers

Of course, these are final answers only. Your responses must be complete and fully justified, using mathematics in the form of diagrams and/or algebraic work.

1. a) $x^2 + y^2 = 9$ **b)** $x^2 + y^2 = 64$
   c) $x^2 + y^2 = 100$ **d)** $x^2 + y^2 = 5$

3. a) $x^2 + y^2 = 25$ **b)** $x^2 + y^2 = 29$
   c) $x^2 + y^2 = 45$

4. a) on   **b)** inside   **c)** outside

5. No.

6. $x^2 + y^2 = 25$

8. a) 50.3 m   **b)** 201 m^2

15. Yes.

19. $x^2 + y^2 = 8$