11.2 Extension: The equation of a circle

1. The equation of a cirle is $(x+4)^2+(y-6)^2=144$. What are the coordinates of the center and the length of the radius of the circle?
   (a) center $(4,-6)$ and radius 12
   (b) center $(-4,6)$ and radius 12
   (c) center $(4,-6)$ and radius 144
   (d) center $(-4,6)$ and radius 144
2. Do Now: What are the coordinates of the center and the length of the radius of the circle whose equation is $(x-3)^2+(y-5)^2=16$?

   Graph the circle in Graspable Math or Geogebra and paste the image here.
3. Do Now: What is the equation of a circle with center $(5,7)$ and radius $r=3$?

   Graph the circle in Graspable Math or Geogebra and paste the image here.
4. Do Now: What is the equation of a circle with center $(-2,5)$ and radius $r=4$?

   Graph the circle in Graspable Math or Geogebra and paste the image here.
5. Do Now: What are the coordinates of the center and the length of the radius of the circle whose equation is $(x-7)^2+(y+1)^2=9$?

   Graph the circle in Graspable Math or Geogebra and paste the image here.
6. What is the equation of a circle with center $(-3,7)$ and radius $r=6$?

   Graph the circle in Graspable Math or Geogebra and paste the image here.
7. Given $A(-1,2)$ and $B(3,5)$, find the length of $\overline{AB}$. Show the substitution into the distance formula.
8. What is the equation of a circle with center $(3,-2)$ and radius $r=8$?

   Graph the circle in Graspable Math or Geogebra and paste the image here.
9. Given the diameter of circle C is $\overline{AB}$, $A(-2,2)$ and $B(6,8)$, find the length of $\overline{AB}$ and hence, the radius of the circle.

   Find the equation of the circle. Graph the circle and its diameter.
10. What is the equation of a circle with center $(1,-3)$ and radius $r=2$?

    Graph the circle in Graspable Math or Geogebra and paste the image here.
11. What is the equation of a circle with center $(4,-6)$ and radius $r=4$?

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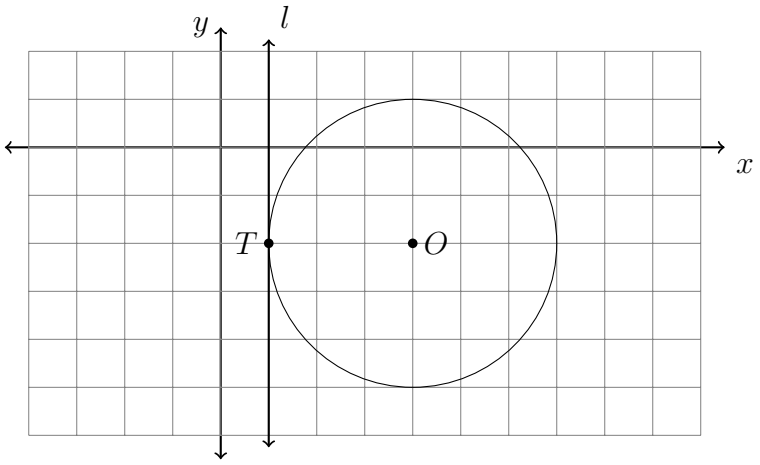
Graph the circle in Graspable Math or Geogebra and paste the image here.

12. What is an equation of circle O shown in the graph below?



(a) $(x-4)^2+(y+2)^2=9$

(b) $(x-4)^2+(y+2)^2=9^2$

(c) $(x+2)^2+(y-4)^2=9$

(d) $(x+2)^2+(y-4)^2=9^2$

Write down the coordinates of the point of tangency T and the equation of the tangent line l.

13. What are the coordinates of the center and the length of the radius of the circle whose equation is $(x-4)^2+(y+3)^2=16$?

(a) center $(-4,3)$ and radius 8

(b) center $(4,-3)$ and radius 4

(c) center $(-4,3)$ and radius 4

(d) center $(4,-3)$ and radius 8

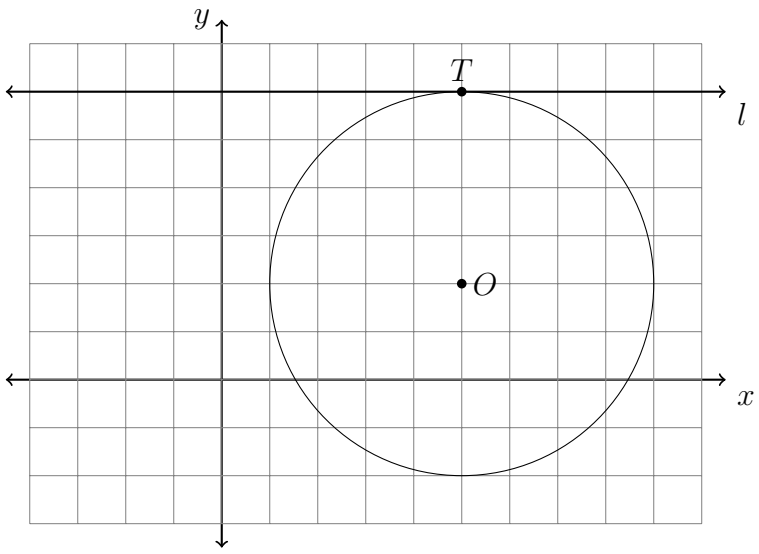
14. What is the equation of a circle with center $(5,0)$ and radius $r=5$?

Graph the circle in Graspable Math or Geogebra and paste the image here.

15. Given the diameter of circle C is $\overline{AB}$, $A(3,2)$ and $B(9,10)$, find the length of $\overline{AB}$ and hence, the radius of the circle.

Find the equation of the circle. Graph the circle and its diameter.

16. What is an equation of circle O shown in the graph below?



(a) $(x-5)^2+(y-2)^2=16$

(b) $(x+5)^2+(y+2)^2=8$

(c) $(x+2)^2+(y+5)^2=8$

(d) $(x-2)^2+(y-5)^2=16$

Write down the coordinates of the point of tangency T and the equation of the tangent line l.

17. What are the coordinates of the center and the length of the radius of the circle whose equation is $(x+8)^2+(y-5)^2=4$?

    (a) center $(-8,5)$ and radius 4

    (b) center $(8,-5)$ and radius 4

    (c) center $(-8,5)$ and radius 2

    (d) center $(8,-5)$ and radius 2

18. What are the coordinates of the center and the length of the radius of the circle whose equation is $(x+4)^2+(y-3)^2=16$?

    (a) center $(-4,3)$ and radius 8

    (b) center $(4,-3)$ and radius 4

    (c) center $(-4,3)$ and radius 4

    (d) center $(4,-3)$ and radius 8

19. What are the coordinates of the center and the length of the radius of the circle whose equation is $(x-7)^2+(y+1)^2=16$?

    (a) center $(-7,1)$ and radius 4

(b) center $(7, -1)$ and radius 8

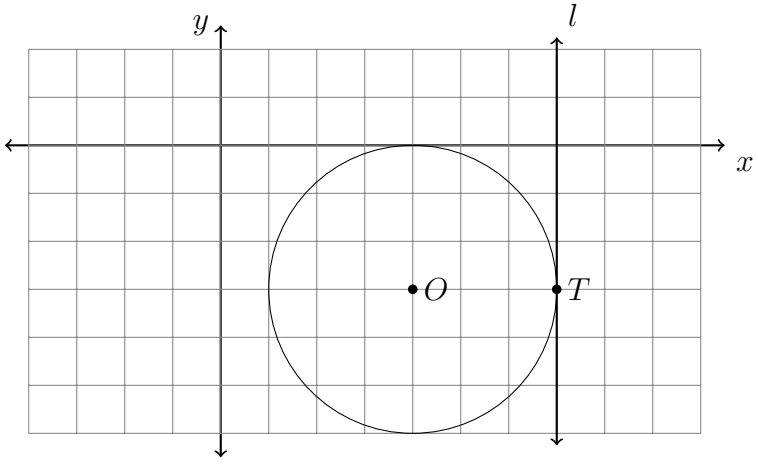
(c) center $(-7, 1)$ and radius 8

(d) center $(7, -1)$ and radius 4

20. Find the volume of a pyramid ($V = \frac{1}{3}Bh$) having a height of 11.3 inches and with a square base having side lengths of 7 inches. Express your result to the *nearest cubic inch*.

21. Find the volume of a hemisphere with a radius of 30 inches, to the *nearest whole cubic inch*. (The formula for the volume of a *sphere* is $V = \frac{4}{3}\pi r^3$ and a *hemisphere* is half of a sphere.)

22. What is an equation of circle O shown in the graph below?



(a) $(x-4)^2+(y+3)^2=9$

(b) $(x-4)^2+(y+3)^2=9^2$

(c) $(x+2)^2+(y-3)^2=9$

(d) $(x+2)^2+(y-3)^2=9^2$

The circle is tangent to line l and the x-axis. Write down the equations of line l and the x-axis.

23. Line segment $\overline{AB}$, $A(2,-1)$, $B(10,5)$, is the diameter of circle M.

(a) On the grid, mark and label as a coordinate pair the midpoint of the segment, the circle center M.

(b) Calculate the length of $\overline{AB}$ and hence, the radius of the circle.

(c) Write down the equation of the circle.

(d) Sketch the circle on the grid or draw it with Geogebra or Graspable Math.