

12.  $(x - (-6))^2 + (y - 3)^2 = 8^2$ , so  $(x + 6)^2 + (y - 3)^2 = 64$

22.  $r = \sqrt{(-10 - (-5))^2 + (-5 - 5)^2}$ , so  $r = \sqrt{125}$ . The circle equation would be  
 $(x + 10)^2 + (y + 5)^2 = 125$

26.  $C = (3, -8)$  and  $r = 10$

Graph points  $(3, -8)$ ,  $(3, 2)$  which is 10 up,  $(3, -18)$  which is 10 down,  $(-7, -8)$  which is 10 left, and  $(13, -8)$  which is 10 right. Connect the last four points in a smooth curve.

30.  $C = (-4, 9)$  and  $r = 12$ ; Therefore the signal is a circle with center at  $(-4, 9)$  and a radius of 12.

36.  $C = (-1, 1)$  and  $r = 2$ , so  $(x + 1)^2 + (y - 1)^2 = 4$

46. Tangent must be perpendicular to the radius at the point of tangency, so the slope of the radius would be  $\frac{6-2}{5-2} = \frac{4}{3}$ ; Therefore the slope of the tangent line would be the opposite reciprocal  $m = -\frac{3}{4}$ . Find the equation of the tangent line:  $y - 6 = -\frac{3}{4}(x - 5)$ , which gives the equation  $y = -\frac{3}{4}x + \frac{39}{4}$ .

Find the  $x$ -intercept:  $0 = -\frac{3}{4}x + \frac{39}{4}$ ; solve for  $x$ :  $\frac{3}{4}x = \frac{39}{4}$ ;  $\frac{4}{3} * \frac{3}{4}x = \frac{39}{4} * \frac{4}{3}$ ;  $x = 13$ .

Therefore, the  $x$ -intercept is  $(13, 0)$

Find the  $y$ -intercept:  $y = -\frac{3}{4}(0) + \frac{39}{4}$ ;  $y = \frac{39}{4}$ ; Therefore, the  $y$ -intercept is  $(0, \frac{39}{4})$

52. Substitute the second equation into the first:  $(x+1)^2 + ((x+8)-1)^2 = 18$ , so  
 $(x+1)^2 + (x+7)^2 = 64$ ;  $x^2 + 2x + 1 + x^2 + 14x + 49 = 64$ ;  $2x^2 + 16x - 14 = 0$ . Now Factor  
to solve for  $x$ :  $(2x+14) + (x+1)^2 = 0$ , so the possible values of  $x$  are  $-7$  and  $-1$ . Plug these  $x$   
values into one of the original equations to solve for  $y$ :  $y = -7 + 8 = 1$  and  $y = -1 + 8 = 7$

Therefore, the points of intersection are  $(-7, 1)$  and  $(-1, 7)$ .

54. a.  $c = \left[ \frac{1}{2}(6) \right]^2 = 9$

b.  $d = \left[ \frac{1}{2}(-4) \right]^2 = 4$

c.  $x^2 + 6x + 9 + y^2 - 4y + 4 = -4 + 9 + 4$ ; When simplified:  $(x+3)^2 + (y-2)^2 = 9$

d.  $C = (-3, 2)$  and  $r = 3$

e.  $x^2 + 4x + 4 + y^2 - 20y + 100 = 4$ ; When simplified:  $(x+2)^2 + (y-10)^2 = 4$ .

Therefore,  $C = (-2, 10)$  and  $r = 2$

58.  $(x-2)^2 + (x+5)^2 = 256$  so Answer D.