

1.1

Circle

Center at (0,0)

$$x^2 + y^2 = r^2 \quad r \text{ radius}$$

$$x^2 + y^2 = 25 \quad r=5$$

(h,k) Center r radius

$$(x-h)^2 + (y-k)^2 = r^2$$

(3,-5) Center r=2

(h, k)

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

$$(x-3)^2 + (y+5)^2 = 4$$

$$86. \quad x^2 + y^2 - 2x + 6y - 15 = 0$$

Group  
x's & y's

$$x^2 - 2x + y^2 + 6y = 15$$

Complete  
the  
square

$$(x^2 - 2x + 1) + (y^2 + 6y + 9) = 15 + 1 + 9$$

$$\begin{array}{l} \frac{-2}{2} \\ \rightarrow (-1)^2 \end{array} \quad \begin{array}{l} \frac{6}{2} \\ 3 \\ 3^2 \\ 9 \end{array}$$

factor

$$(x-1)(x-1) + (y+3)(y+3) = 25$$

$$(x-1)^2 + (y+3)^2 = 25$$

$$(x-h)^2 + (y-k)^2 = r^2$$

Center  $(1, -3)$       Radius  $r=5$

$$89. \quad 2x^2 + 2y^2 - 2x - 2y - 3 = 0$$

$$\rightarrow 2x^2 - 2x + 2y^2 - 2y = 3$$

$$2\left(x^2 - x + \frac{1}{4}\right) + 2\left(y^2 - y + \frac{1}{4}\right) = 3 + \frac{1}{2} + \frac{1}{2}$$

$$\frac{2\left(x - \frac{1}{2}\right)^2}{2} + \frac{2\left(y - \frac{1}{2}\right)^2}{2} = 4$$

$$\left(x - \frac{1}{2}\right)^2 + \left(y - \frac{1}{2}\right)^2 = 2$$

Center  $\left(\frac{1}{2}, \frac{1}{2}\right)$  Radius  $r = \sqrt{2}$

$$17. \quad d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$15 = \sqrt{(x-3)^2 + (5-(-4))^2}$$

$$(15)^2 = \left( \sqrt{(x-3)^2 + 81} \right)^2$$

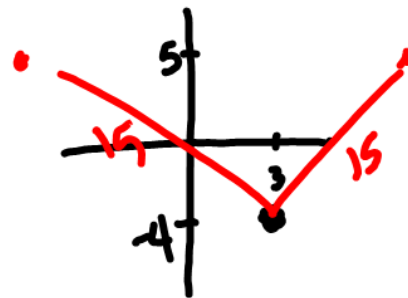
$$225 = (x-3)^2 + 81$$

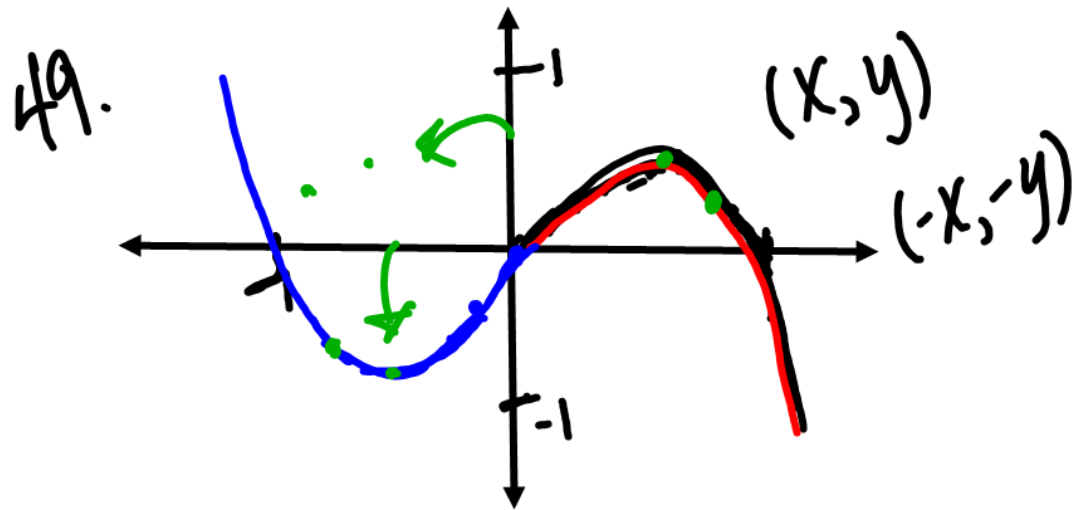
$-81$ 
 $-81$

$$\sqrt{144} = \sqrt{(x-3)^2}$$

$$\pm 12 = x-3$$

$$x = 15 \text{ or } x = -9$$





97. 1980 → 16  
1990 → 20

% Increase  $\frac{20-16}{16}$

25%

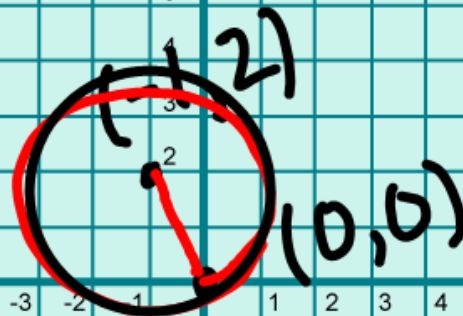
$$d = \sqrt{(-1-0)^2 + (2-0)^2}$$

$$d = \sqrt{5}$$

$$r = \sqrt{5}$$

X

-14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14



$$(x-h)^2 + (y-k)^2 = r^2$$

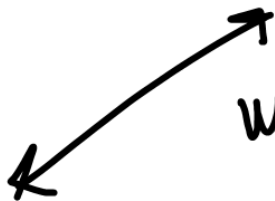
$$(x+1)^2 + (y-2)^2 = 5$$

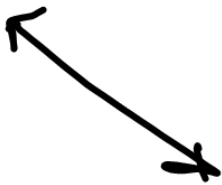
-10


Y

# 1.2 Slope

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \frac{\text{rise}}{\text{run}}$$

Pos.  up right

Neg  down right

Zero  $y = -3$    $\frac{0}{100} \frac{\text{rise}}{\text{run}}$

Undefined  $x = 9$    $\frac{2}{0}$

$$y = mx + b$$