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Completing square

$x^2 + 12x + 36$

$(x+6)(x+6)$

$(x+6)^2$

$y^2 - 14y + 49$

$(y-7)(y-7)$

$(y-7)^2$

2.4 Circles

Distance formula

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $\quad (x_1, y_1) = h, k$

$\downarrow$ $\quad (x_2, y_2) = x, y$

$r = \sqrt{(x-h)^2 + (y-k)^2}$

$\sqrt{(x-h^2)^2 + (y-k_1^2)} = r$

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

2.4.7 $\quad r = 6 \quad C(3, -5)$

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

$(x-(3))^2 + (y-(-5))^2 = 6^2$

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

2.4.25 $\quad \frac{2(x-5)^2}{2} + \frac{2y^2}{2} = \frac{8}{2}$

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

2.4.17 $\quad \boxed{(x+3)^2 + (y+4)^2 = 25}$

09.17.2019 9:54a Sections 2.4 (All) and 2.5 (Start) 9/17/19, 5:55 AM, 1h 18m 42s

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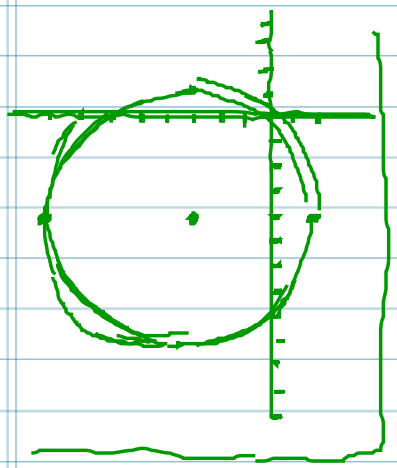


General form eq.

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

$x^2 - 6x + 9 + y^2 + 10y + 25 = 36$

$-36 \quad -36$

$x^2 - 6x + y^2 + 10y - 2 = 0$

$x^2 + y^2 + ax + by + c = 0$

2.4.17 $x^2 + y^2 - 6x + 10y - 2 = 0$

$(x+3)^2 + (y+4)^2 = 25$

$x^2 + 6x + 9 + y^2 + 8y + 16 = 25$

$-25 \quad -25$

$x^2 + y^2 + 6x + 8y + 0 = 0$

2.4.33) $2x^2 + 2y^2 - 16x + 8y - 10 = 0$

$x^2 + y^2 - 8x + 4y - 5 = 0$

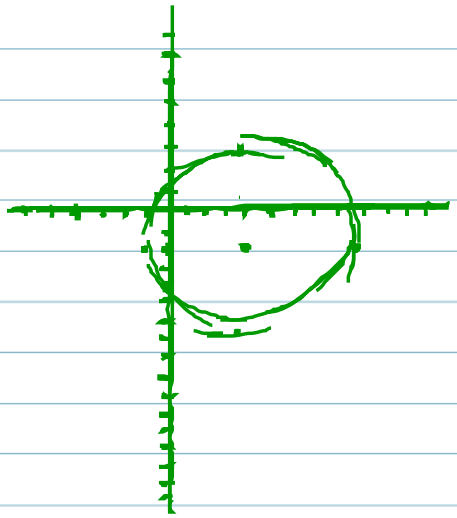
$x^2 - 8x + 16 + y^2 + 4y + 4 = 5 + 16 + 4$

$(-4)^2 \qquad (+2)^2 \quad 4$

$(x-4)^2 + (y+2)^2 = 25$

Center $(4, -2)$

$r = 5$



Intercepts

$x^2 + y^2 - 8x + 4y - 5 = 0$

y-int $(x=0)$

$y^2 + 4y - 5 = 0$

$(y+5)(y-1) = 0$

$y = -5, \; y = 1$

X-int ($y=0$)

$$x^2 - 8x - 5 = 0$$

$$\frac{8 \pm \sqrt{64 - 4(-5)}}{2}$$

$$\frac{8 \pm \sqrt{84}}{2} \qquad \frac{8 \pm 2\sqrt{21}}{2} = \boxed{4 \pm \sqrt{21}}$$

2.5 Variation

4 A varies directly with x^2

$$A = Kx^2$$

8 The square of T varies directly with the cube of a and inversely with the square of d

$$T^2 = \frac{Ka^3}{d^2}$$