PRECALC – BE | WEDNESDAY 2-24-10

① Solve by completing the square

$$2x^2 - 7x - 15 = 0$$

$$\frac{2x^2}{2} - \frac{7x}{2} = \frac{15}{2}$$

$$x^2 - \frac{7}{2}x + \left(\frac{7}{4}\right)^2 = \frac{15}{2} + \frac{49}{16} = \frac{120}{16} + \frac{49}{16}$$

$$\left(x - \frac{7}{4}\right)^2 = \frac{169}{16}$$

$$x - \frac{7}{4} = \pm\sqrt{\frac{169}{16}} = \pm\frac{13}{4}$$

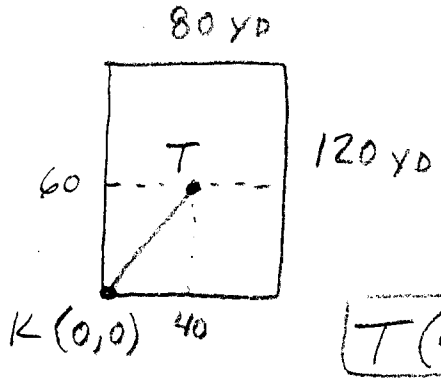
$$x = \frac{7}{4} \pm \frac{13}{4}$$

$$x = \left\{\frac{20}{4}, -\frac{6}{4}\right\}$$

$$\boxed{x = \left\{5, -\frac{3}{2}\right\}}$$

PreCalc - Homework Review Pg 620 #11-12, 17-19

(11.)



$\boxed{T(40,60)}$

$d^2 = (60-0)^2 + (40-0)^2 = 3600 + 1600 = 5200$

$d = \sqrt{5200} = \sqrt{100}\sqrt{52} = 10\sqrt{52}$

$10\sqrt{4}\sqrt{13}$

(yds) $\boxed{20\sqrt{13}}$ EXACT

$20(3.61) \approx \boxed{72.1 \text{ yds}}$

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(12) $d = 13 \quad M = (1.5, 7)$

(17) $d = 16 \quad M = (a, -1)$

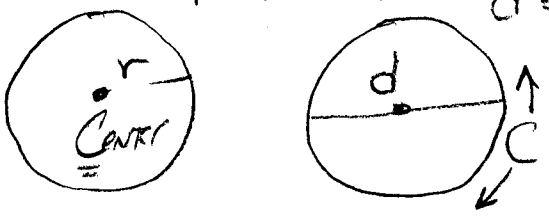
(18) $d = 8 \quad M = (r+2, s)$

(19) $d = \sqrt{5} \quad M = \left(c+1, d - \frac{1}{2}\right)$

Ch. 10-2 Circles

LOCUS OF POINTS (IN A PLANE) EQUIDISTANT FROM A GIVEN POINT

r = radius d = diameter



$C = 2\pi r$ = Circumference

$A = \pi r^2$ = Area

C = Center or Focus

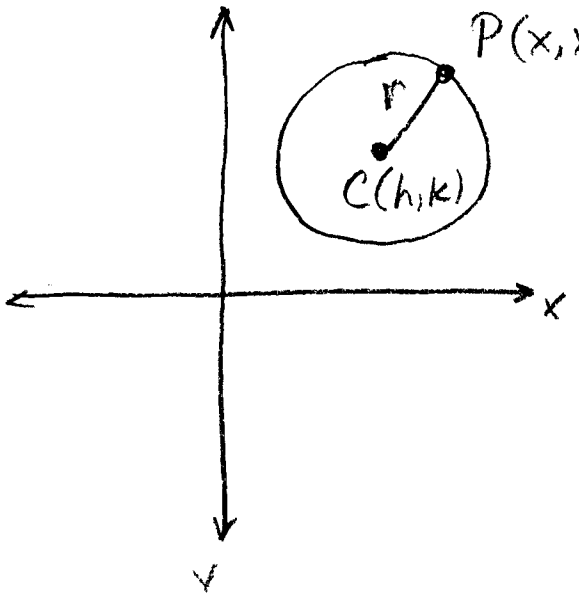
ONE type of CONIC SECTION —
See pg 623

USE THE DISTANCE FORMULA TO FIND THE EQUATION OF A CIRCLE

"h-k Form"

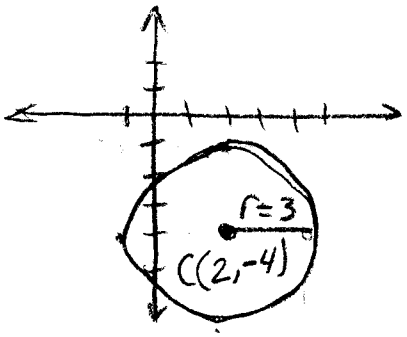
$$r^2 = (x-h)^2 + (y-k)^2$$

BOOK CALLS THIS "STANDARD"



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

$C(2,-4)$ $r = \sqrt{9} = 3$



Switching Between "h-k Form" and "STANDARD" Form (see pg 625) or as the book calls it... "general form"!

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

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

$$x^2 - 2hx + h^2 + y^2 - 2ky + k^2 = r^2$$

$$x^2 + y^2 + (-2h)x + (-2k)y + (h^2 + k^2) - r^2 = 0$$

D E F

h, k, r are constants, Let $D = -2h$

$E = -2k$

$F = (h^2 + k^2) - r^2$

$$\therefore \boxed{x^2 + y^2 + Dx + Ey + F = 0}$$

"General" Form of Equation of Circle

Coefficients of x^2, $y^2 \equiv 1$

If not, divide them out!!

Can go back to "h-k form" by

Completing the square on x part and y part.

Ex 3 Pg 626 Given: $2x^2+2y^2-4x+12y-18=0$

General form $\Rightarrow$ $x^2+y^2-2x+6y-9=0$

Change to h, k form

$x^2-2x+\bigcirc+y^2+6y+\bigcirc=9$

$x^2-2x+\boxed{1^2}+y^2+6y+\boxed{3^2}=9+\boxed{1}+\boxed{9}$

$\boxed{(x-1)^2+(y+3)^2=19}$

Center $(1,-3)$ $r=\sqrt{19}$

or $(x-1)^2+(y+3)^2=(\sqrt{19})^2$

OPTIONAL, TO SHOW r more clearly.

Graph $\Rightarrow$ $r\approx 4.4$ units

Homework: Pg 627 # 6, 8, 9