

Ch 9 - Circles

Sec 9.1 HW

#1 a) $x^2 + y^2 = 10$ Center radius
 $(x-0)^2 + (y-0)^2 = \sqrt{10}^2$ $(0,0)$, $\sqrt{10}$

b) $3x^2 + 1 = 7 - 3y^2$ not an ellipse b/c
 $3x^2 + 3y^2 = 6$ the coeffs of x^2, y^2 are the same
 $x^2 + y^2 = 2$ $(0,0)$, $\sqrt{2}$

c) $x^2 - 5 = (2-y)(2+y)$
 $x^2 - 5 = 4 - y^2$
 $x^2 + y^2 = 9$ $(0,0)$, 3

d) $(x-3)^2 + (y+1)^2 = 9$ $(3,-1)$, 3

e) $(-4,-3)$, $r=4$

f) $(-2,0)$, $r=\sqrt{5}$

→ g) $x^2 - x + y^2 = 2$

Comp. eg. $x^2 - x + \frac{1}{4} + y^2 = 2 + \frac{1}{4}$

$(x - \frac{1}{2})^2 + y^2 = \frac{9}{4}$ $(\frac{1}{2}, 0)$, $r = 3/2$

h) $x^2 + y^2 + 6x + 6y = 17$

$x^2 + 6x + 9 + y^2 + 6y + 9 = 17 + 18$

Comp. 2 squares $(x+3)^2 + (y+3)^2 = 35$ $(-3,-3)$, $r = \sqrt{35}$

i) $x^2 - 4x + 4 + y^2 + 2y + 1 = 15 + 4 + 1$

$(x-2)^2 + (y+1)^2 = 20$ $(2,-1)$, $r = 2\sqrt{5}$

#2 a) $x^2 + y^2 = 9$

b) $(x-2)^2 + (y+3)^2 = 49$

c) $(x-10)^2 + (y-8)^2 = 4$

$(-2, 5), (4, 1)$

#3 $r = \frac{1}{2} \sqrt{(-2-5)^2 + (5-1)^2}$ gave 2 pts on circle
 $= \frac{1}{2} \sqrt{49 + 16} = \frac{1}{2} \sqrt{65} = \sqrt{65}/2$ radius

Center Midpt = $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$
 $= \left(\frac{-2+5}{2}, \frac{5+1}{2} \right) = \left(\frac{3}{2}, 3 \right)$
 (h, k)

$\left(x - \frac{3}{2}\right)^2 + (y-3)^2 = 65/4$

#4 $x^2 + y^2 = 1$

#5 ~~Find~~ To find x-int, set $y=0$:

$x^2 - 8x + 5 + 11 = 0$

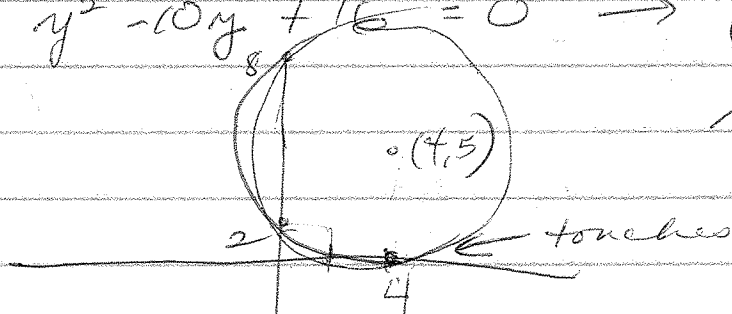
$x^2 - 8x + 16 = 0 \rightarrow (x-4)^2 = 0 \rightarrow x=4$

~~But this is not the answer~~

To find y-int, set $x=0$:

$y^2 - 10y + 16 = 0 \rightarrow (y-2)(y-8) = 0$

$y = 2, 8$



$x^2 - 8x + 16 + y^2 - 10y + 25 = 25$
 $(x-4)^2 + (y-5)^2 = 25$

#6 $r=4$, center $(5,2)$

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

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

$$b) y-2 = \pm \sqrt{16 - (x-5)^2}$$

$$c) y = 2 \pm \sqrt{16 - (x-5)^2} \quad \text{top: } y = \sqrt{\quad} + 2$$

$$\text{top } y = \sqrt{16 - (x-5)^2} + 2$$

$$\text{bottom } y = -\sqrt{\quad} + 2$$

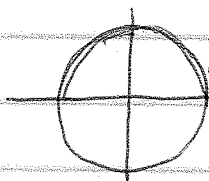
$$c) y = -\sqrt{16 - (x-5)^2} + 2$$

$$d) x-5 = \pm \sqrt{16 - (y-2)^2}$$

$$x = \sqrt{16 - (y-2)^2} + 5$$

$$e) x = -\sqrt{16 - (y-2)^2} + 5$$

#7 $y = \sqrt{5-x^2} \rightarrow y^2 = 5-x^2 \rightarrow x^2 + y^2 = 5$



Top of circle w center $(0,0)$ & radius $\sqrt{5}$

#8 $x = \sqrt{16-y^2}$

Right half of circle w
center $(0,0)$ & radius 4

#9 $y = \sqrt{9 - (x+1)^2} + 2$

Top half of circle w
center $(-1,2)$ & radius 3

