Key   Date _____ 2012 _____
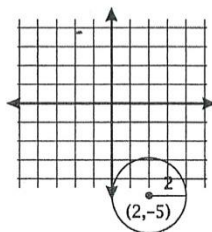
10.7 – Equation of a Circle

Graph each circle and label its center and radius.

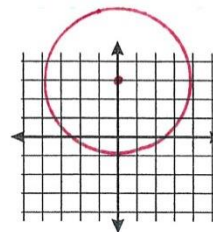**Example:** $(x - 2)^2 + (y + 5)^2 = 4$
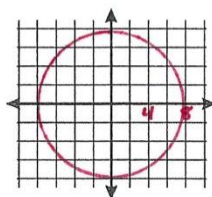center $(2, -5)$
radius = 2
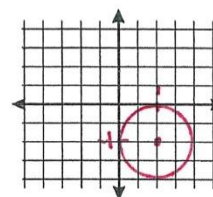
1. $x^2 + (y - 3)^2 = 16$

center $(0, 3)$
radius = 4

2. $x^2 + y^2 = 64$
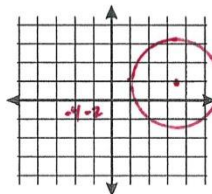
Center $(0, 0)$
radius = 8

3. $(x - 1)^2 + (y + 1)^2 = 1$
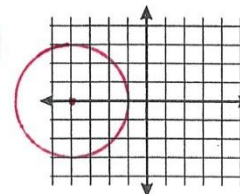
center $(1, -1)$
radius = 1

4. $(x - 7)^2 + (y - 2)^2 = 25$
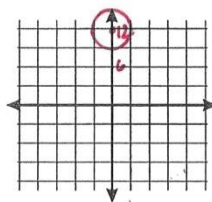
center $(7, 2)$
radius = 5

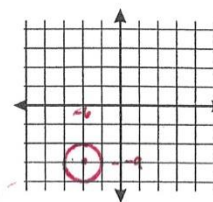**5.** $(x + 4)^2 + y^2 = 9$

center $(-4, 0)$
radius = 3

6. $x^2 + (y - 12)^2 = 20$

center $(0, 12)$
radius = $2\sqrt{5}$

7. $(x + 6)^2 + (y + 9)^2 = 15$

center $(-6, -9)$
radius = $\sqrt{15}$
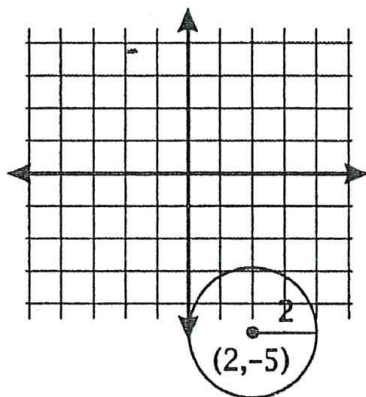
Name_____*Key*_____ Date_____*2012*_____

10.7 – Equation of a Circle

Graph each circle and label its center and radius.

Example: $(x - 2)^2 + (y + 5)^2 = 4$
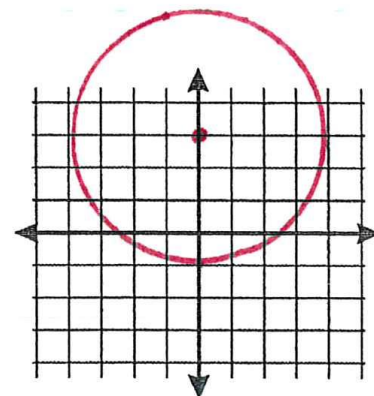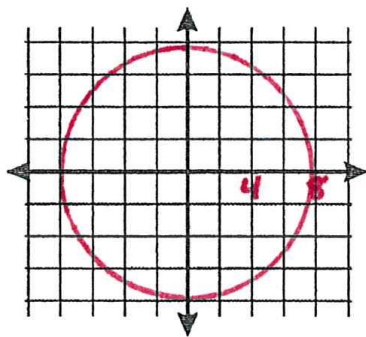   center $(2, -5)$
   radius $= 2$

1. $x^2 + (y - 3)^2 = 16$

center $(0, 3)$
radius $= 4$

2. $x^2 + y^2 = 64$

Center $(0, 0)$
radius $= 8$

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

center $(1, -1)$
radius $= 1$

center $(1, -1)$
radius $= 1$

4. $(x - 7)^2 + (y - 2)^2 = 25$

center $(7, 2)$
radius $= 5$

5. $(x + 4)^2 + y^2 = 9$

center $(-4, 0)$
radius $\doteq 3$

6. $x^2 + (y - 12)^2 = 20$

center $(0, 12)$
radius $= 2\sqrt{5}$

7. $(x + 6)^2 + (y + 9)^2 = 15$

center $(-6, -9)$
radius $= \sqrt{15}$

ANSWERS

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

center (h,k)

radius r

Given the equation for a circle, identify its center and its radius.

Example: $(x - 2)^2 + (y - 3)^2 = 25$
center $(2, 3)$
radius $= 5$

1. $(x - 4)^2 + (y + 10)^2 = 144$
center $(4, -10)$
radius $= 12$

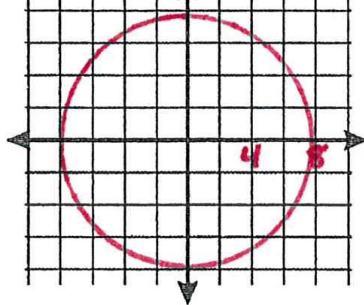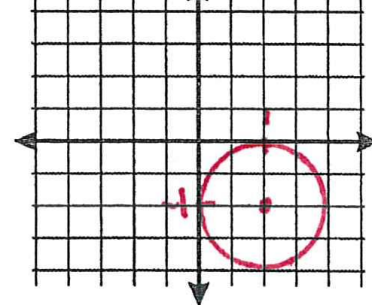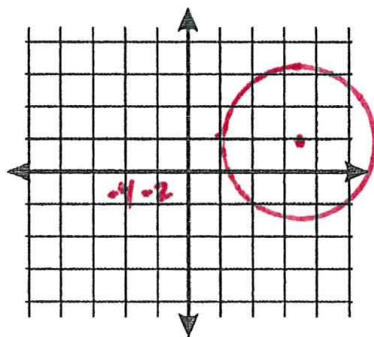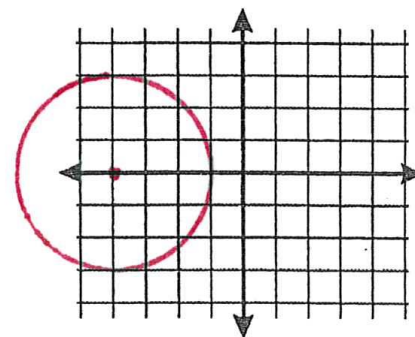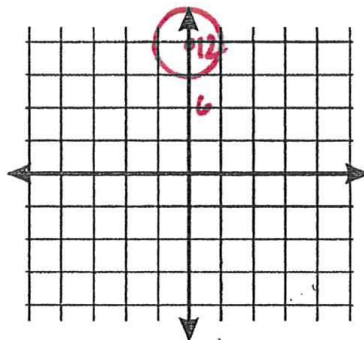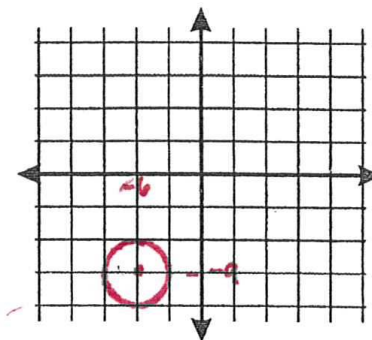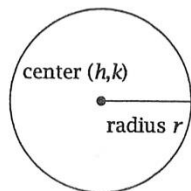**2.** $x^2 + (y - 7)^2 = 49$
center $(0, 7)$
radius $= 7$

3. $x^2 + y^2 = 1$
center $(0, 0)$
radius $= 1$

4. $(x + 3)^2 + (y + 11)^2 = 15$
center $(-3, -11)$
radius $= \sqrt{15}$

5. $(x - 15)^2 + y^2 = 10$
center $(15, 0)$
radius $= \sqrt{10}$

Given the center and the radius of a circle, write the equation describing the circle.

Example: $(0, 4), r = 9$
$(x - 0)^2 + (y - 4)^2 = 81$
$x^2 + (y - 4)^2 = 81$

1. $(0, 0), r = 8$
$x^2 + y^2 = 64$

2. $(-2, 3), r = 2$
$(x + 2)^2 + (y - 3)^2 = 4$

3. $(-7, -18), r = 14$
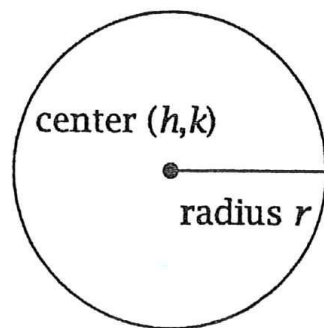$(x + 7)^2 + (y + 18)^2 = 196$

4. $(12, 9), r = 1$
$(x - 12)^2 + (y - 9)^2 = 1$

5. $(10, 0), r = 22$
$(x - 10)^2 + y^2 = 484$

ANSWERS

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

center (h,k)

radius r

Given the equation for a circle, identify its center and its radius.

Example: $(x - 2)^2 + (y - 3)^2 = 25$
center $(2, 3)$
radius $= 5$

1. $(x - 4)^2 + (y + 10)^2 = 144$

center $(4, -10)$
radius $= 12$

2. $x^2 + (y - 7)^2 = 49$

center $(0, 7)$
radius $= 7$

3. $x^2 + y^2 = 1$

center $(0, 0)$
radius $= 1$

4. $(x + 3)^2 + (y + 11)^2 = 15$

center $(-3, -11)$
radius $= \sqrt{?}$

5. $(x - 15)^2 + y^2 = 10$

center $(15, 0)$
radius $= \sqrt{?}$

radius = 1

center (0,0)
radius = 1

4. $(x + 3)^2 + (y + 11)^2 = 15$

center $(-3, -11)$
radius $= \sqrt{15}$

5. $(x - 15)^2 + y^2 = 10$

center $(15, 0)$
radius $= \sqrt{10}$

Given the center and the radius of a circle, write the equation describing the circle.

Example: $(0, 4), r = 9$
$(x - 0)^2 + (y - 4)^2 = 81$
$x^2 + (y - 4)^2 = 81$

1. $(0, 0), r = 8$

$x^2 + y^2 = 64$

2. $(-2, 3), r = 2$

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

3. $(-7, -18), r = 14$

$(x + 7)^2 + (y + 18)^2 = 196$

4. $(12, 9), r = 1$

$(x - 12)^2 + (y - 9)^2 = 1$
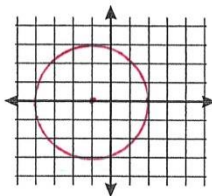
5. $(10, 0), r = 22$

$(x - 10)^2 + y^2 = 484$

following, graph each circle by first completing the square.

1) $x^2 + y^2 + 2x - 8 = 0$

$x^2 + 2x \quad + y^2 = 8$

$x^2 + 2x + 1 + y^2 = 8 + 1$

$(x + 1)^2 + y^2 = 9$
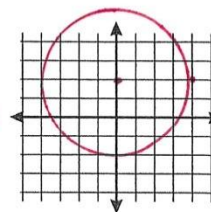
Center $(-1, 0)$

Radius $= 3$

2) $x^2 + y^2 - 4y = 12$

$x^2 + y^2 - 4y \quad = 12$

$x^2 + y^2 - 4y + 4 = 12 + 4$

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

Center $(0, 2)$

Radius $= 4$

3) $x^2 + y^2 - 2x + 4y = -1$

$x^2 - 2x \quad + y^2 + 4y \quad = -1$

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

$(x - 1)^2 + (y + 2)^2 = 4$
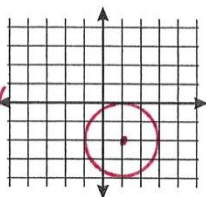
Center $(1, -2)$

Radius $= 2$

4) $x^2 + y^2 + 4x + 2y = 4$

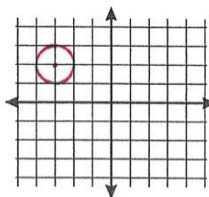$x^2 + 4x \quad + y^2 + 2y \quad = 4$

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

$(x + 2)^2 + (y + 1)^2 = 9$

Center $(-2, -1)$

Radius $= 3$

5) $x^2 + y^2 + 6x - 4y = -12$

$x^2 + 6x \quad + y^2 - 4y \quad = -12$

$x^2 + 6x + 9 + y^2 - 4y + 4 = -12 + 9 + 4$

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

Center $(-3, 2)$

radius $= 1$
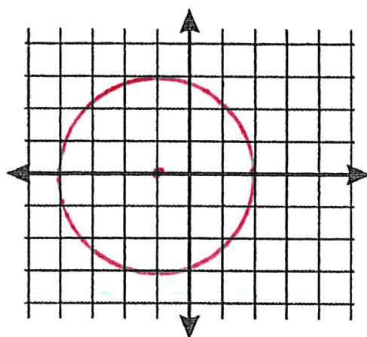
For the following, graph each circle by first completing the square.

1) $x^2 + y^2 + 2x - 8 = 0$

$x^2 + 2x \quad + y^2 = 8$

$x^2 + 2x + 1 + y^2 = 8 + 1$

$(x + 1)^2 + y^2 = 9$

Center $(-1, 0)$

Radius $= 3$

2) $x^2 + y^2 - 4y = 12$

$x^2 + y^2 - 4y \quad = 12$

$x^2 + y^2 - 4y + 4 = 12 + 4$

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

Center $(0, 2)$

Radius $= 4$

3) $x^2 + y^2 - 2x + 4y = -1$

$x^2 - 2x \quad + y^2 + 4y \quad = -1$

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

$(x - 1)^2 + (y + 2)^2 = 4$

Center $(1, -2)$

Radius $= 2$

4) $x^2 + y^2 + 4x + 2y = 4$

$x^2 + 4x \quad + y^2 + 2y \quad = 4$

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

$(x + 2)^2 + (y + 1)^2 = 9$

Center $(-2, -1)$
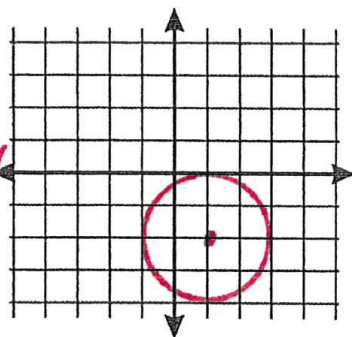
Radius $= 3$

3) $x^2 + y^2 - 2x + 4y = -1$

$x^2 - 2x \quad + y^2 + 4y \quad = -1$

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

$(x-1)^2 + (y+2)^2 = 4$

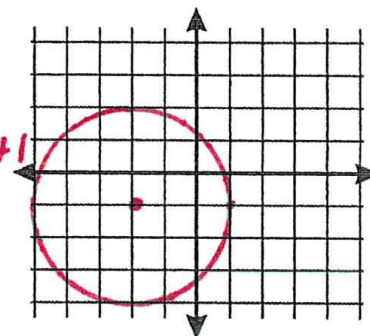Center $(1, -2)$

Radius $= 2$

4) $x^2 + y^2 + 4x + 2y = 4$

$x^2 + 4x \quad + y^2 + 2y \quad = 4$
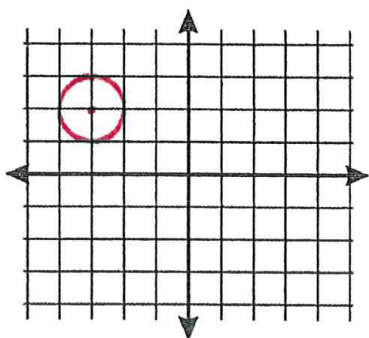
$x^2 + 4x + 4 + y^2 + 2y + 1 = 4 + 4 + 1$

$(x+2)^2 + (y+1)^2 = 9$

Center $(-2, -1)$

Radius $= 3$

5) $x^2 + y^2 + 6x - 4y = -12$

$x^2 + 6x \quad + y^2 - 4y \quad = -12$

$x^2 + 6x + 9 + y^2 - 4y + 4 = -12 + 9 + 4$

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

Center $(-3, 2)$

radius $= 1$