Geometry **Completing the Square Review Worksheet and Writing Equations of Circles WS 1**

1. $x^2 + 10x$_____

2. $x^2 - 16x$_____

Ex: Use completing the square to solve the equation.

3. $x^2 + 14x - 61 = 0$

4. $x^2 + 2x - 65 = -10$

5. $x^2 = 72 - 16x$

6. $x^2 - 12x = 39$

Writing Circle Equations in Standard Form (Completing the Square)

Recall: Circle Equation in Standard Form: $(x - h)^2 + (y - k)^2 = r^2$ **Center: (h, k)** **Radius: r**

Write the below equations in standard form, then identify center and radius of circle:

1) $x^2 + y^2 - 2x + 28y + 181 = 0$

2) $x^2 + y^2 + 20x + 20y + 164 = 0$

Circle Equation in Standard Form: $(x-h)^2+(y-k)^2=r^2$ Center: (h, k) Radius: r

Write the below equations in standard form, then identify center and radius of circle:

3) $x^2+y^2-16y-36=0$

4) $x^2+y^2-2x+24y+120=0$

5) $x^2+y^2-28x-10y+220=0$

6) $x^2+y^2-32x-24y+396=0$

7) $x^2+y^2+8x-20=0$

8) $x^2+y^2+32x-20y+352=0$

Geometry **Completing the Square Review Worksheet and Writing Equations of Circles WS 1**

Key

1. $x^2 + 10x + 25$

$(x+5)^2$

	x	$+5$
x	x^2	$5x$
$+5$	$5x$	25

2. $x^2 - 16x + 64$

$(x-8)^2$

	x	-8
x	x^2	$-8x$
-8	$-8x$	$+64$

Ex: Use completing the square to solve the equation.

3. $x^2 + 14x - 61 = 0$

$x^2+14x+49=61+49$

$\boxed{(x+7)^2 = 110}$

	x	$+7$
x	x^2	$7x$
$+7$	$7x$	49

4. $x^2 + 2x - 65 = -10$

$x^2+2x+\_ = 65-10+\_$

$x^2+2x+1 = 55+1$

$\boxed{(x+1)^2 = 56}$

	x	$+1$
x	x^2	$1x$
$+1$	$1x$	1

5. $x^2 = 72 - 16x$

$x^2+16x+64=72+64$

$\boxed{(x+8)^2 = 136}$

	x	$+8$
x	x^2	$8x$
$+8$	$8x$	64

6. $x^2 - 12x = 39$

$x^2-12x+36=39+36$

$\boxed{(x-6)^2 = 75}$

	x	-6
x	x^2	$-6x$
-6	$-6x$	$+36$

Writing Circle Equations in Standard Form (Completing the Square)

Recall: Circle Equation in Standard Form: $(x-h)^2 + (y-k)^2 = r^2$ **Center: (h, k)** **Radius: r**

1) Group x's and y's

2) Complete square for x's and y's

Write the below equations in standard form, then identify center and radius of circle:

1) $x^2 + y^2 - 2x + 28y + 181 = 0$

$x^2-2x+1+y^2+28y+196 = -181+1+196$

	x	-1
x	x^2	$-x$
-1	$-x$	1

	y	$+14$
y	y^2	$14y$
$+14$	$14y$	196

$\boxed{(x-1)^2 + (y+14)^2 = 16}$

$\boxed{C: (1, -14) \quad r = 4}$

2) $x^2 + y^2 + 20x + 20y + 164 = 0$

$x^2+20x+100+y^2+20y+100 = -164+100+100$

	x	10
x	x^2	$10x$
10	$10x$	100

	y	10
y	y^2	$10y$
10	$10y$	100

$\boxed{(x+10)^2 + (y+10)^2 = 36}$

$\boxed{C: (-10, -10) \quad r = 6}$

Circle Equation in Standard Form: $(x-h)^2+(y-k)^2=r^2$ Center: (h, k) Radius: r

$\left(\frac{b}{2}\right)^2 = \left(\frac{24}{2}\right)^2 = 12^2$

Write the below equations in standard form, then identify center and radius of circle:

3) $x^2+y^2-16y-36=0$

$x^2+y^2-16y+\underline{64}=36+\underline{64}$

	y -8
y	
-8	64

$x^2+(y-8)^2=100$

$\boxed{(x-0)^2+(y-8)^2=100}$

$\boxed{C:(0,8)}$ $\boxed{r=10}$

4) $x^2+y^2-2x+24y+120=0$

$x^2-2x+\underline{1}+y^2+24y+\underline{144}=-120+\underline{1}+\underline{144}$

$\boxed{(x-1)^2+(y+12)^2=25}$

$\boxed{C:(1,-12)}$

$\boxed{r=5}$

5) $x^2+y^2-28x-10y+220=0$

$x^2-28x+\underline{196}+y^2-10y+\underline{25}=-220+\underline{196}+\underline{25}$

	x -14
x	
-14	196

	y -5
y	y^2 / 5y
-5	5y / 25

$\boxed{(x-14)^2+(y-5)^2=1}$

$\boxed{C:(14,5)}$

$\boxed{r=1}$

6) $x^2+y^2-32x-24y+396=0$

$x^2-32x+\underline{256}+y^2-24y+\underline{144}=-396+\underline{256}+\underline{144}$

	x -16
x	x^2 / -16x
-16	-16x /

	y -12
y	
-12	144

$\boxed{(x-16)^2+(y-12)^2=4}$

$\boxed{C:(16,12)}$

$\boxed{r=2}$

7) $x^2+y^2+8x-20=0$

$x^2+8x+\underline{16}+y^2=20+\underline{16}$

	x + 4
x	x^2 / 4x
+4	4x / 16

$(x+4)^2+y^2=36$

$\boxed{(x+4)^2+(y-0)^2=36}$

$\boxed{C:(-4,0)\quad r=6}$

8) $x^2+y^2+32x-20y+352=0$

$x^2+32x+\underline{256}+y^2-20y+\underline{100}=-352+\underline{256}+\underline{100}$

	x +16
x	x^2 / 16x
+16	16x / 256

	y -10
y	y^2 / -10y
+10	-10y / 100

$\boxed{(x+16)^2+(y-10)^2=4}$

$\boxed{C:(-16,10)}$

$\boxed{r=2}$