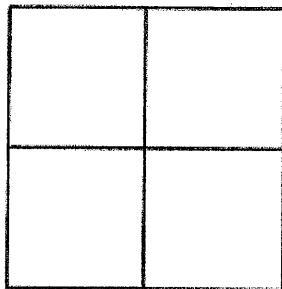
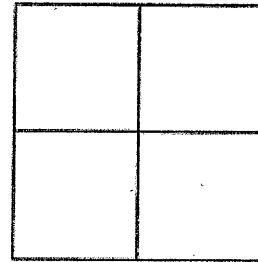


Geometry Completing the Square Review Worksheet and Writing Equations of Circles WS 1

1. $x^2 + 10x$ _____

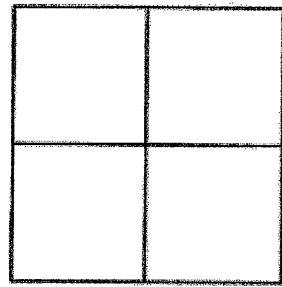


2. $x^2 - 16x$ _____

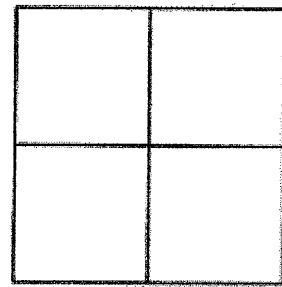


Ex: Use completing the square to solve the equation.

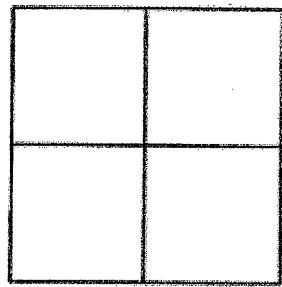
3. $x^2 + 14x - 61 = 0$



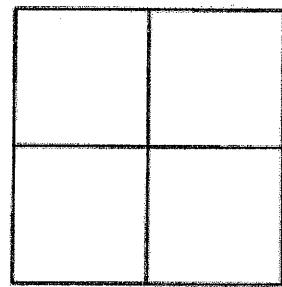
4. $x^2 + 2x - 65 = -10$



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
+	X
5	$5x$
	25

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

$$(x-8)^2$$

X - 8	
X	x^2
-8	-8x
	+64

Ex: Use completing the square to solve the equation.

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

$$\begin{aligned} x^2 + 14x + 49 &= 61 + 49 \\ (x+7)^2 &= 110 \end{aligned}$$

X + 7	
X	x^2
+	7x
	49

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

$$\begin{aligned} x^2 + 2x + \underline{\quad} &= 65 - 10 + \underline{\quad} \\ x^2 + 2x + 1 &= 55 + 1 \end{aligned}$$

$$(x+1)^2 = 56$$

X + 1	
X	x^2
+	1x
	1

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

$$\begin{aligned} x^2 + 16x + 64 &= 72 + 64 \\ (x+8)^2 &= 136 \end{aligned}$$

X + 8	
X	x^2
+	8x
	64

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

$$\begin{aligned} x^2 - 12x + \underline{36} &= 39 + \underline{36} \\ (x-6)^2 &= 75 \end{aligned}$$

X - 6	
X	x^2
-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

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

- 1) Group x's and y's
- 2) Complete square for x's and y's

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

$$x^2 - 2x + \underline{1} + y^2 + 28y + \underline{196} = -181 + \underline{1} + \underline{196}$$

X	x^2	10x
Y	y^2	10y
-1	1	
1	1	

$$(x-1)^2 + (y+14)^2 = 16$$

$$C: (1, -14)$$

$$r = 4$$

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

$$x^2 + 20x + \underline{100} + y^2 + 20y + \underline{100} = -164 + \underline{100} + \underline{100}$$

X	x^2	10x	Y	y^2	10y
10	10x	100	10	10y	100
10	10x	100	10	10y	100
10	10x	100	10	10y	100

$$(x+10)^2 + (y+10)^2 = 36$$

$$C: (-10, -10)$$

$$r = 6$$

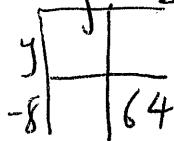
Circle Equation in Standard Form: $(x - h)^2 + (y - k)^2 = r^2$ Center: (h, k) Radius: r

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

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

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

$$x^2 + y^2 - 16y + 64 = 36 + 64$$



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

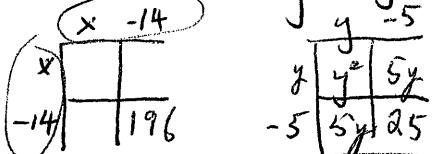
$$(x - 0)^2 + (y - 8)^2 = 100$$

$C: (0, 8)$

$r = 10$

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

$$x^2 - 28x + 196 + y^2 - 10y + 25 = -220 + 196 + 25$$



$$(x - 14)^2 + (y - 5)^2 = 11$$

$C: (14, 5)$

$r = 1$

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

$$x^2 - 2x + 1 + y^2 + 24y + 144 = -120 + 1 + 144$$

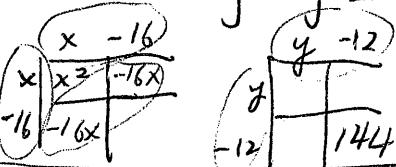
$$(x - 1)^2 + (y + 12)^2 = 25$$

$C: (1, -12)$

$r = 5$

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

$$x^2 - 32x + 256 + y^2 - 24y + 144 = -396 + 256 + 144$$



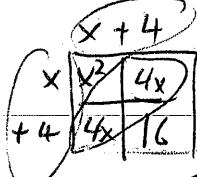
$$(x - 16)^2 + (y + 12)^2 = 4$$

$C: (16, -12)$

$r = 2$

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

$$x^2 + 8x + 16 + y^2 = 20 + 16$$



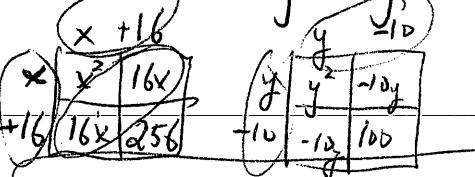
$$(x + 4)^2 + y^2 = 36$$

$$(x + 4)^2 + (y - 0)^2 = 36$$

$C: (-4, 0)$ $r = 6$

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

$$x^2 + 32x + 256 + y^2 - 20y + 100 = -352 + 256 + 100$$



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

$C: (-16, 10)$

$r = 2$