

Circles – Equation of a Circle

G.GPE.A.1

Notes Section 11.4

Name _____

Review Perfect Square Trinomial

Completing the square when a = 1

What makes a trinomial a perfect square?

$$(x - 3)^2 = x^2 - 6x + 9$$

$$(x + 4)^2 = x^2 + 8x + 16$$

$$(2x - 5)^2 = 4x^2 - 20x + 25$$

$$x^2 + 20x + 100 = (x + 10)^2$$

$$x^2 + 14x + 7 = (x + 49)^2$$

$$25x^2 + 60x + 36 = (5x + 6)^2$$

Complete these Perfect Square Trinomials

$$x^2 \underline{+ 10x} + 25$$

$$x^2 \underline{+ 20x} + 100$$

$$x^2 \underline{+ 20x} + 121$$

$$x^2 - 4x + \underline{4}$$

$$x^2 + 8x + \underline{16}$$

$$x^2 + 16x + \underline{64}$$

$$ax^2 + bx + c = 0$$

$$x^2 + bx + c = 0$$

$$\left(x^2 + bx + \left(\frac{b}{2}\right)^2\right) - \left(\frac{b}{2}\right)^2 + c = 0$$

Find the constant that would complete each square.

#1) $x^2 + 2x = 0$

$$\begin{aligned} \left(x^2 + 2x + \left(\frac{2}{2}\right)^2\right) &= \left(\frac{2}{2}\right)^2 \\ (x^2 + 2x + 1) &= 1 \\ (x + 1)^2 &= 1 \end{aligned}$$

#2) $x^2 + 10x - 8 = 0$

$$\begin{aligned} \left(x^2 + 10x + \left(\frac{10}{2}\right)^2\right) &= 8 + \left(\frac{10}{2}\right)^2 \\ (x^2 + 10x + 25) &= 8 + 25 \\ (x + 5)^2 &= 33 \end{aligned}$$

#3) $x^2 + 14x - 1 = 0$

$$\begin{aligned} (x^2 + 14x + 49) &= 1 + 49 \\ (x + 7)^2 &= 50 \end{aligned}$$

#4) $x^2 + 15x = 12$

$$\begin{aligned} \left(x^2 + 15x + \left(\frac{15}{2}\right)^2\right) &= 12 + \left(\frac{15}{2}\right)^2 \\ \left(x^2 + \frac{15}{2}\right)^2 &= \frac{48}{4} + \frac{225}{4} \\ \left(x^2 + \frac{15}{2}\right)^2 &= \frac{273}{4} \end{aligned}$$

#5) $x^2 + 1x - 14 = 0$

$$\begin{aligned} \left(x^2 + x + \left(\frac{1}{2}\right)^2\right) &= 14 + \left(\frac{1}{2}\right)^2 \\ \left(x + \frac{1}{2}\right)^2 &= \frac{56}{4} + \frac{1}{4} \\ \left(x + \frac{1}{2}\right)^2 &= \frac{57}{4} \end{aligned}$$