

3.14 - Homework

Date _____

Solve each equation by completing the square.

1) $x^2 - 4x - 89 = 0$

$$x^2 - 4x = 89$$

$$x^2 - 4x + 4 = 89 + 4$$

$$(x-2)^2 = 93$$

$$x-2 = \pm\sqrt{93}$$

$$x = 2 \pm \sqrt{93}$$

2) $x^2 - 20x + 51 = 0$

3) $x^2 - 2x - 99 = 0$

$$x^2 - 2x = 99$$

$$x^2 - 2x + 1 = 99 + 1$$

$$(x-1)^2 = 100$$

$$x-1 = \pm 10$$

$$x = 1 \pm 10 = \boxed{11, 9}$$

4) $x^2 + 2x - 59 = 0$

5) $n^2 + 8n + 11 = 7$

$$n^2 + 8n = -4$$

$$n^2 + 8n + 16 = -4 + 16$$

$$(n+4)^2 = 12$$

$$n+4 = \pm\sqrt{12}$$

$$n = -4 \pm 2\sqrt{3}$$

6) $p^2 + 2p + 36 = 4$

7) $r^2 - 4r - 24 = -3$

$$r^2 - 4r = 21$$

$$r^2 - 4r + 4 = 21 + 4$$

$$(r-2)^2 = 25$$

$$r-2 = \pm 5$$

$$r = 2 \pm 5 = \boxed{7, -3}$$

8) $x^2 - 18x + 63 = -2$

9) $x^2 + 75 = 20x$

$$x^2 - 20x + 75 = 0$$

$$x^2 - 20x = -75$$

$$x^2 - 20x + 100 = -75 + 100$$

$$(x-10)^2 = 25$$

$$x-10 = \pm 5$$

$$x = 10 \pm 5 = \boxed{15, -5}$$

10) $n^2 = -26 - 16n$