

Complete the Square Practice

Solve each equation by completing the square. Exact solutions only.

1) $n^2 + 18n - 2 = 0$

$$n^2 + 18n + 81 = 2 + 81$$

$$(n+9)^2 = 83$$

$$n = -9 \pm \sqrt{83}$$

2) $\frac{8k^2}{8} + \frac{16k}{8} + \frac{6}{8} = 0$

$$k^2 + 2k + \frac{1}{4} = -\frac{3}{4} + \frac{1}{4}$$

$$(k+1)^2 = \frac{1}{4}$$

$$k = -1 \pm \frac{1}{2} < \begin{matrix} -3/2 \\ -1/2 \end{matrix}$$

3) $4p^2 - 16p - 88 = -4$

$$p^2 - 4p + \frac{4}{4} = 84 + \frac{4}{4}$$

$$(p-2)^2 = 88$$

$$p = 2 \pm 2\sqrt{22}$$

4) $x^2 + 20x + 83 = 10$

$$x^2 + 20x + \frac{100}{4} = -73 + \frac{100}{4}$$

$$(x+10)^2 = 27$$

$$x = -10 \pm 3\sqrt{3}$$

Change to vertex form.

5) $v^2 - 16v - 161 = 0$

$$y = v^2 - 16v - 161$$

$$y + 161 + \frac{64}{4} = v^2 - 16v + \frac{64}{4}$$

$$y = (v-8)^2 - 225$$

6) $9a^2 + 18a - 93 = 0$

$$y = 9a^2 + 18a - 93$$

$$y + 93 + \frac{9}{9} = 9(a^2 + 2a + \frac{1}{9})$$

$$y + 102 = 9(a+1)^2$$

$$y = 9(a+1)^2 - 102$$