

Complete the Square Practice

Solve each equation by completing the square.

$(\frac{-6}{2})^2$ 1) $a^2 - 6a - 72 = 0$

$\boxed{\{12, -6\}}$ ✓

$a^2 - 6a + \frac{9}{1} = 72 + \frac{9}{1}$

$(a-3)^2 = 81$

$a-3 = \pm 9$

$a = 3 \pm 9$

$(\frac{12}{2})^2$ 2) $x^2 + 12x + 56 = 0$

$\boxed{\{-6 + 2i\sqrt{5}, -6 - 2i\sqrt{5}\}}$ ✓

$x^2 + 12x + 36 = -56 + 36$

$(x+6)^2 = -20$

$x+6 = \pm \sqrt{-20}$

$x+6 = \pm 2i\sqrt{5}$ $x = -6 \pm 2i\sqrt{5}$

$(\frac{11}{2})^2$ 3) $n^2 + 11n - 80 = 0$

$\boxed{\{5, -16\}}$ ✓

$n^2 + 11n + \frac{121}{4} = 80 + \frac{121}{4}$

$(n + \frac{11}{2})^2 = \frac{320}{4} + \frac{121}{4}$

$(n + \frac{11}{2})^2 = \frac{441}{4}$

$n + \frac{11}{2} = \pm \frac{21}{2}$ $n = -\frac{11}{2} \pm \frac{21}{2}$

4) $x^2 - 19x + 91 = 0$

$(\frac{19}{2})^2$

$\boxed{\{\frac{19+i\sqrt{3}}{2}, \frac{19-i\sqrt{3}}{2}\}}$ ✓

$x^2 - 19x + \frac{361}{4} = -91 + \frac{361}{4}$

$(x - \frac{19}{2})^2 = \frac{-364}{4} + \frac{361}{4}$

$(x - \frac{19}{2})^2 = \frac{-3}{4}$ $x - \frac{19}{2} = \pm \frac{i\sqrt{3}}{2}$

5) $4a^2 - 8a + 3 = 0$ Divide by 4!

$\boxed{\{\frac{3}{2}, \frac{1}{2}\}}$ ✓

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

$(a-1)^2 = \frac{1}{4}$

$a-1 = \pm \frac{1}{2}$ $a = \frac{2}{2} \pm \frac{1}{2}$

$a = 1 \pm \frac{1}{2}$

6) $3m^2 - 12m - 39 = 0$

$\boxed{\{2 + \sqrt{17}, 2 - \sqrt{17}\}}$ ✓

Divide by 3!

$m^2 - 4m + \frac{4}{3} = \frac{39}{3} + \frac{4}{3}$

$(m-2)^2 = \frac{39}{3} + \frac{12}{3}$

$(m-2)^2 = \frac{51}{3}$ $m-2 = \pm \sqrt{17}$

$(m-2)^2 = 17$ $m = 2 \pm \sqrt{17}$

7) $5x^2 - 14x + 34 = 0$ Divide by 5! ☺

$\boxed{\{\frac{7+11i}{5}, \frac{7-11i}{5}\}}$ ✓

$(\frac{14}{5 \cdot 2})^2$

$(\frac{14}{5} \cdot \frac{1}{2})^2$

$x^2 - \frac{14}{5}x + \frac{49}{25} = -\frac{34}{5} + \frac{49}{25}$

$(x - \frac{7}{5})^2 = \frac{-170}{25} + \frac{49}{25}$

$(x - \frac{7}{5})^2 = \frac{-121}{25}$

$x - \frac{7}{5} = \pm \frac{11i}{5}$ $x = \frac{7}{5} \pm \frac{11i}{5}$

8) $3x^2 - 3x - 60 = 0$

$(\frac{-1}{2})^2$ $\boxed{\{5, -4\}}$ ✓ Divide by 3!

$x^2 - x + \frac{1}{4} = 20 + \frac{1}{4}$

$(x - \frac{1}{2})^2 = \frac{81}{4}$

$x - \frac{1}{2} = \pm \frac{9}{2}$

$x = \frac{1}{2} \pm \frac{9}{2}$