

Solve the given equations by using the quadratic formula.

7a. $x^2 + 3x - 2 = 0$

7b. $7x^2 - 2x = -5$

Solution:

7a) $x^2 + 3x - 2 = 0$

The Quadratic Formula: For $ax^2 + bx + c = 0$, the value of x is given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Here $a=1$, $b=3$ and $c=-2$, so

$$x = \frac{-3 \pm \sqrt{3^2 - 4 \times 1 \times (-2)}}{2 \times 1} = \frac{-3 \pm \sqrt{17}}{2}$$

Then the solution is $x = -\frac{3}{2} + \frac{\sqrt{17}}{2}$ and $x = -\frac{3}{2} - \frac{\sqrt{17}}{2}$

7b) $7x^2 - 2x + 5 = 0$

Here $a=7$, $b=-2$ and $c=5$, so

$$x = \frac{2 \pm \sqrt{2^2 - 4 \times 7 \times 5}}{2 \times 7} = \frac{2 \pm \sqrt{-136}}{14} = \frac{2 \pm \sqrt{-4 \times 34}}{14} = \frac{2 \pm i2\sqrt{34}}{14} = \frac{1 \pm i\sqrt{34}}{7}$$

Then the solution is $x = \frac{1}{7} + i\frac{\sqrt{34}}{7}$ and $x = \frac{1}{7} - i\frac{\sqrt{34}}{7}$