$x^2 + x - 2$

$a = 1$, $b = 1$, $c = -2$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-1 \pm \sqrt{1 - 4(1)(-2)}}{2} = \frac{-1 \pm 3}{2}$$

$$\begin{cases} x_1 = -2 \\ x_2 = 1 \end{cases}$$

(b) $2x^3 + 11x^2 - 7x - 6 = 0$

Step 1 Rational Root Theorem

$2 = a_n = b$, $-6 = a_0 = a$

$a \in \{\pm 1, \pm 2, \pm 3, \pm 6\}$

$b \in \{\pm 1, \pm 2\}$

$\frac{a}{b} \in \{\pm 1, \pm 2, \pm 3, \pm 6, \pm \frac{3}{2}, \pm \frac{1}{2}\}$ ← All in the Candidates!

Try $x = 1$

$2(1) + 11 - 7 - 6 = 0$ ✓

Step 2. Polynomial Division

$$(2x^3 + 11x^2 - 7x - 6) \div (x - 1) = 2x^2 + 13x + 6$$

$$\begin{array}{ll} -2x^3 + 2x^2 & \\ \hline 13x^2 - 7x & 2x^2(x-1) \\ -13x^2 + 13x & 13x(x-1) \\ \hline 6x - 6 & 6(x-1) \\ -6x + 6 & \\ \hline 0 & \end{array}$$

Step 3. Quadratic Formula

$2x^2 + 13x + 6 = 0$

$a = 2$, $b = 13$, $c = 6$

$$x = \frac{-13 \pm \sqrt{(13)^2 - 4(2)(6)}}{4} = \frac{-13 \pm 11}{4}$$

$$x_1 = \frac{-24}{4} = -6, \quad x_2 = -\frac{2}{4} = -\frac{1}{2}$$

$$\begin{cases} x_0 = 1 \\ x_1 = -6 \\ x_2 = -\frac{1}{2} \end{cases}$$

Plug in to the original fn: $2(-6)^3 + 11(-6)^2 - 7(-6) - 6 = 0$

$2(-\frac{1}{2})^3 + 11(-\frac{1}{2})^2 - 7(-\frac{1}{2}) - 6 = 0$