

Second degree

$$\bullet f(x) = x^2 + 6x - 8$$

$$\Delta = b^2 - 4ac$$

$$= 6^2 - 4 \times 1 \times (-8)$$

$$= 36 + 32$$

$$= 68.$$

$$x_1 = \frac{-6 - \sqrt{68}}{2} = \frac{-6 - 2\sqrt{17}}{2}$$

$$= -3 - \sqrt{17}$$

$$\text{et } x_2 = -3 + \sqrt{17}$$

$$\text{donc } f(x) = (x - x_1)(x - x_2).$$

$$\bullet f(x) = 2x^2 + 12x + 18$$

$$\Delta = b^2 - 4ac$$

$$= 144 - 4 \times 2 \times 18$$

$$= 144 - 144$$

$$= 0$$

$$x_0 = -\frac{b}{2a} = -3$$

$$\text{donc } f(x) = 2(x + 3)^2.$$

- $f(x) = x^2 + 5x - 6.$

$$x_1 = \frac{-5 - 2\sqrt{3}}{2}$$

$$x_2 = -\frac{5}{2} + 2\sqrt{3}$$

$$f(x) = (x - x_1)(x - x_2)$$

- $f(x) = -3x^2 + 2x + 5.$

$$\Delta = 64$$

$$x_1 = \frac{-10}{-6} = \frac{10}{6} = \frac{5}{3}.$$

$$x_2 = -1$$

donc :

$$f(x) = -3\left(x - \frac{5}{3}\right)(x + 1).$$

$$\bullet f(x) = 2x^2 + x\sqrt{5} - 15.$$

$$\Delta = 5 - 4 \times 2 \times -15$$

$$= 5 + 120$$

$$= 125$$

$$x_1 = \frac{-\sqrt{5} - 5\sqrt{5}}{4} = \frac{-6\sqrt{5}}{4} = -\frac{3\sqrt{5}}{2}$$

$$x_2 = \frac{-\sqrt{5} + 5\sqrt{5}}{4} = \frac{4\sqrt{5}}{4} = \sqrt{5}.$$

$$f(x) = 2\left(x + \frac{3\sqrt{5}}{2}\right)(x - \sqrt{5}).$$

$$\bullet f(x) = x^2 + x - 1.$$

$$\Delta = 5$$

$$x_1 = \frac{-1 - \sqrt{5}}{2}$$

$$x_2 = \frac{-1 + \sqrt{5}}{2}$$

$$f(x) = (x - x_1)(x - x_2).$$

- $f(x) = -x^2 + 2x - 1$

↳ $f(x) = -(x-1)^2$

- $f(x) = x^2 - x + 2.$

$$\Delta = -7 < 0$$

- $f(x) = -3x^2 + 7x + 1$

$$x_1 = \frac{-7 - \sqrt{61}}{-6} = \frac{7 + \sqrt{61}}{6}$$

$$x_2 = -\frac{7 + \sqrt{61}}{-6} = \frac{7 - \sqrt{61}}{6}$$

- $f(x) = x^2 + 3x - 10$

$$x_1 = \frac{-3 - \sqrt{49}}{2 \times 1} = -5$$

$$x_2 = 2.$$

$$f(x) = (x + 5)(x - 2).$$

- $f(x) = 3x^2 + 12x + 12.$

$$x_0 = -2$$

$$f(x) = 3(x + 2)^2.$$