a) $f_1(x) = 1x^2 + 0x + 0$

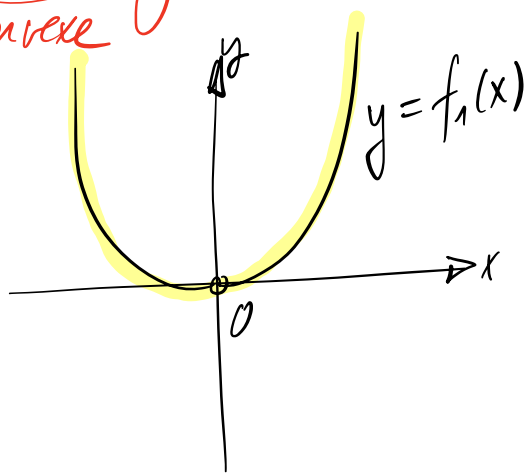
$a = 1 \quad b = 0 \quad c = 0$

convexe ∪

$\Delta = b^2 - 4ac = 0$

$x_1 = x_2 = \frac{-0 \pm \sqrt{0}}{2} = 0$

$S(0; 0) \qquad f_1(0) = 0$



b) $f_2(x) = 1x^2 + 0x - 9$

$a = 1 \quad b = 0 \quad c = 0$

convexe ∪

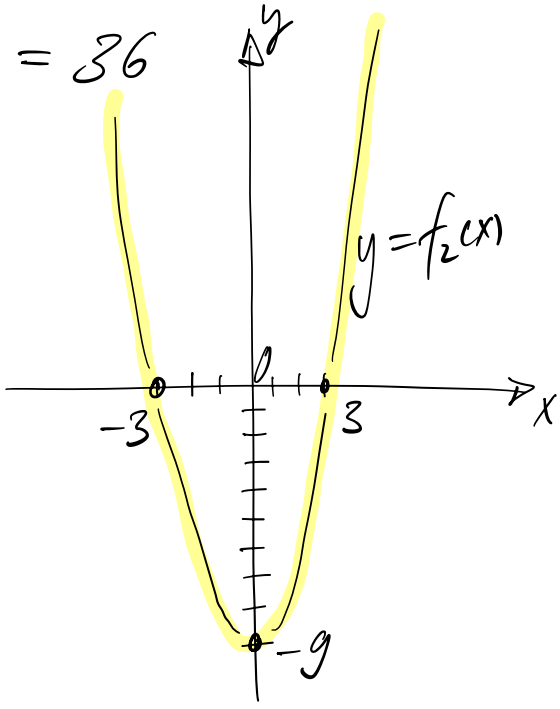
$\Delta = b^2 - 4ac = 0^2 - 4 \cdot 1 \cdot (-9) = 36$

$x_1 = \frac{-0 + \sqrt{36}}{2} = 3$

$x_2 = \frac{-0 - \sqrt{36}}{2} = -3$

$f_2(0) = -9$

$\left(\frac{-0}{2 \cdot 1}; -\frac{36}{4}\right) = (0; -9)$



c) $f_3(x) = x^2 + 5x + 6$

$a = 1 \quad b = 5 \quad c = 6$

convexe ∪

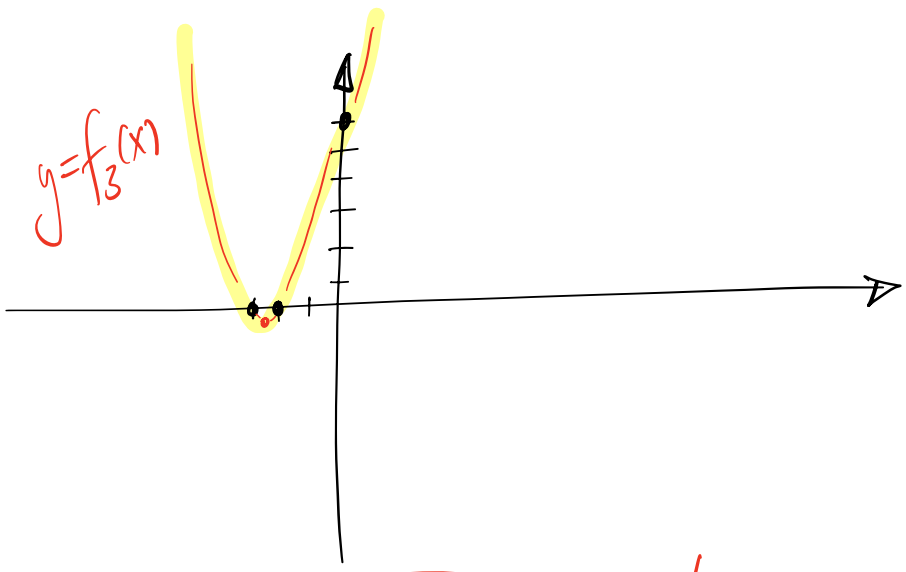
$\Delta = b^2 - 4ac = 25 - 4 \cdot 1 \cdot 6 = 1$

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

$x_2 = \frac{-5 - \sqrt{1}}{2} = -3$

$f_3(0) = 6 \quad$ 0.0. $(0; 6)$

$S\left(-\frac{5}{2}; -\frac{1}{4}\right) \quad S(-2{,}5; -0{,}25)$



d) $f_4(x) = 1 \cdot x^2 - x - 6$ $\quad a = 1 > 0$ $\cup$ convexe

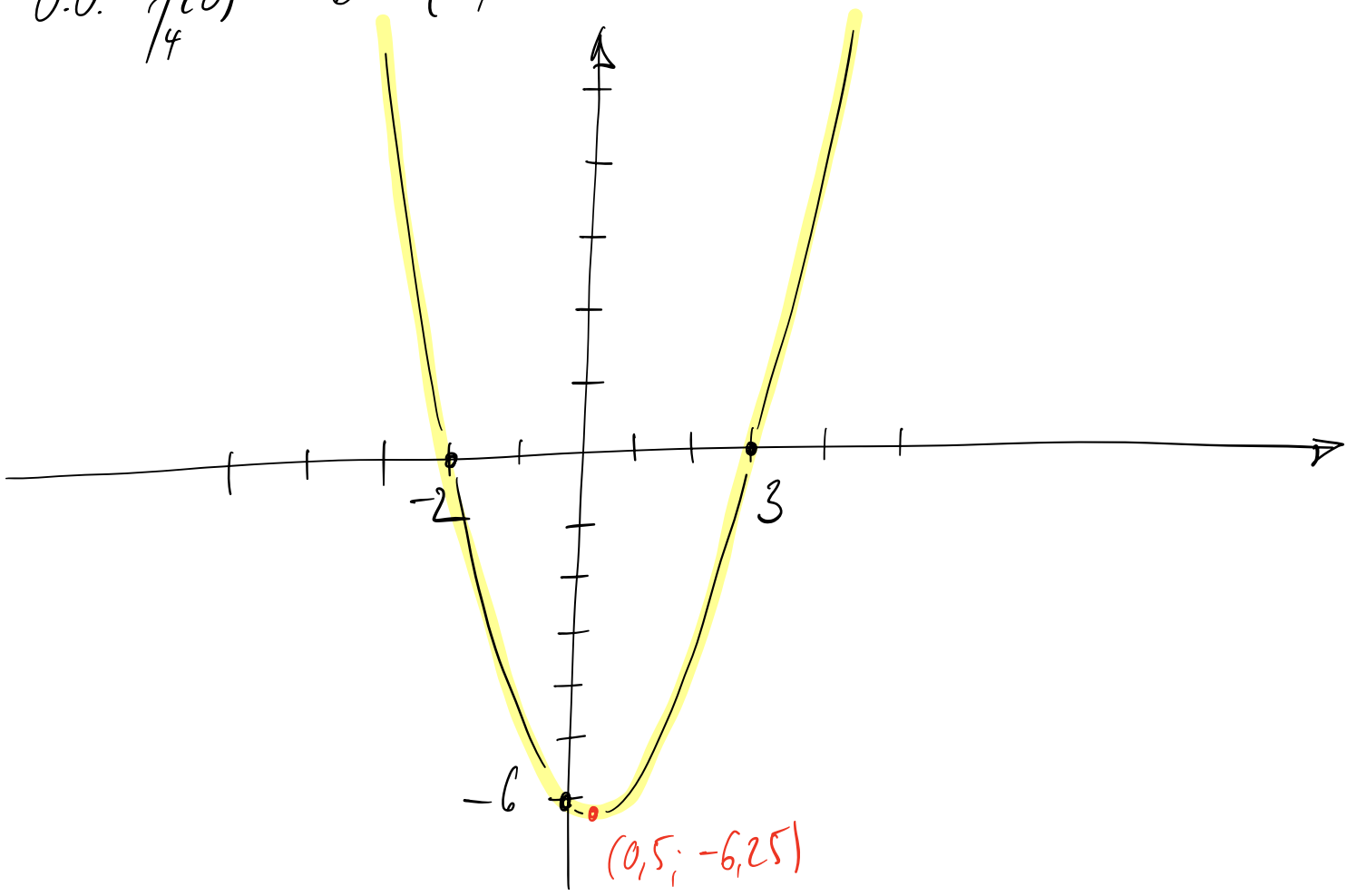
$\Delta = (-1)^2 - 4 \cdot 1 \cdot (-6) = 1 + 24 = 25$

$x_1 = \dfrac{-(-1) + \sqrt{25}}{2} = 3$

$x_2 = \dfrac{1 - 5}{2} = -2$

$S\left(\frac{1}{2}; -\frac{25}{4}\right) \Leftrightarrow S(0{,}5; -6{,}25)$

0.0. $f_4(0) = -6$ $\quad (0; -6)$



e) $f_5(x) = 4 - x^2 = -x^2 + 0x + 4 = (-1)x^2 + 0x + 4$

$a = -1 < 0$ concave $\cap$

$\triangle = 0^2 - 4 \cdot (-1) \cdot 4 = 16$

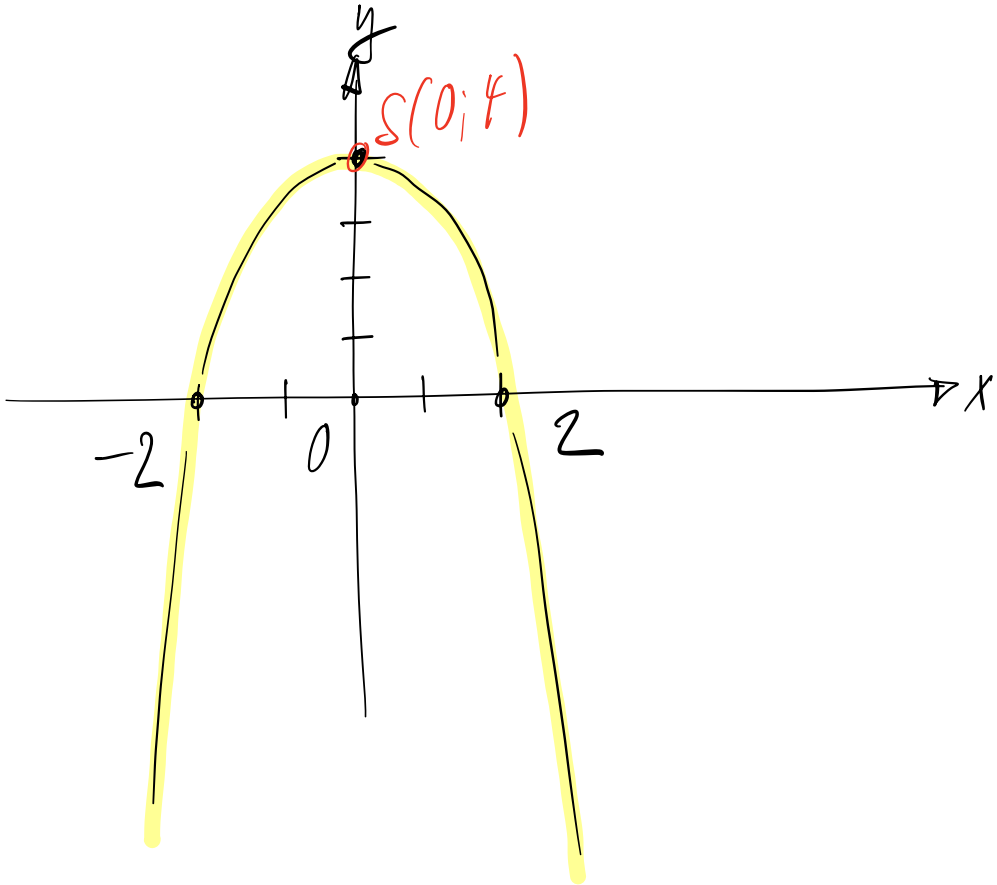
$x_1 = \frac{-0 + \sqrt{16}}{-2} = \frac{4}{-2} = -2$

$x_2 = \frac{-0 - \sqrt{16}}{-2} = \frac{-4}{-2} = 2$

$S\left(\frac{-0}{2 \cdot (-1)} ; \frac{-16}{-4}\right)$

$S(0; 4)$

0.0.: $f_5(0) = 4$ $(0; 4)$



f) $f_6(x) = x^2 + x - 1$ $a = 1 > 0$ concave $\cup$

$\Delta = 1^2 - 4 \cdot 1 \cdot (-1) = 5$

$x_1 = \frac{-1+\sqrt{5}}{2} \cong 0{,}618$

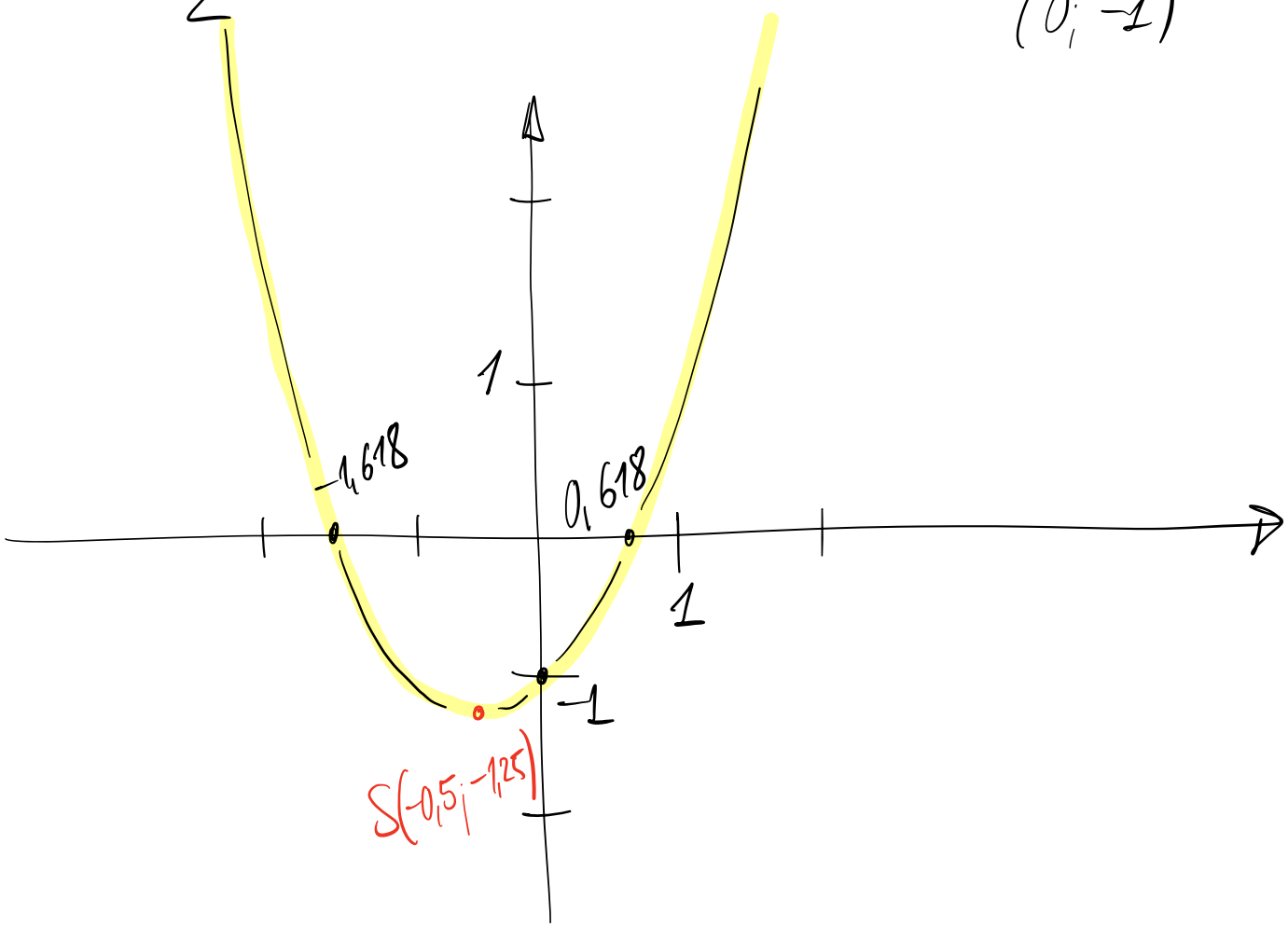
$x_2 = \frac{-1-\sqrt{5}}{2} \cong -1{,}618$

$S\left(\frac{-1}{2}; \frac{5}{4}\right)$

$S(-0{,}5; -1{,}25)$

O.O. $f_6(0) = -1$

$(0; -1)$



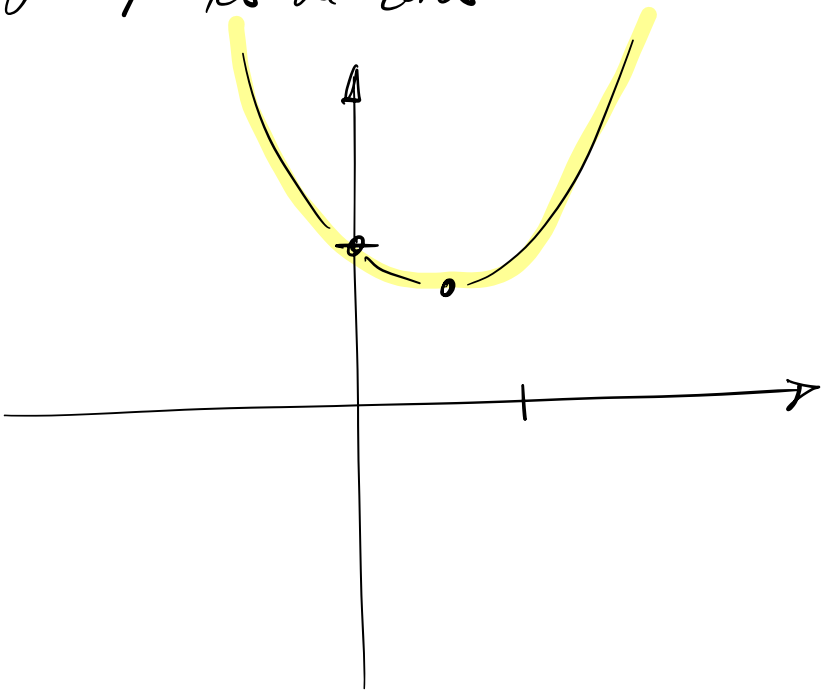
g) $f_7(x) = x^2 - x + 1$ $\quad a = 1 > 0$ convexe ∪

$\Delta = 1 - 4 \cdot 1 \cdot 1 = -3 < 0 \Rightarrow$ Pas de zéros

$f(0) = 1 \quad (0; 1)$

$S\left(\frac{1}{2}; \frac{3}{4}\right)$

$S(0{,}5; 0{,}75)$



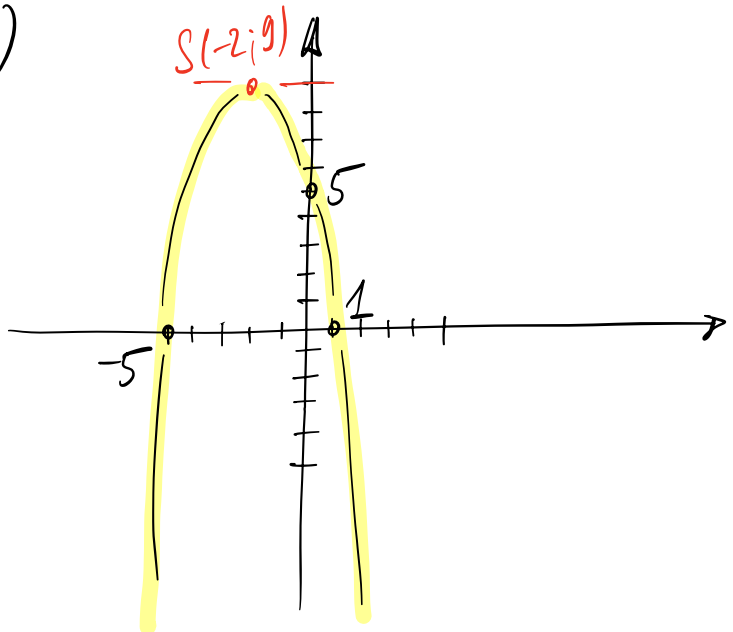
h) $f_8(x) = -x^2 - 4x + 5$ $\quad a = -1 < 0$ concave ∩

$\Delta = 16 - 4 \cdot (-1) \cdot 5 = 16 + 20 = 36$

$x_1 = \frac{4 + \sqrt{36}}{-2} = -5 \qquad x_2 = \frac{4 - 6}{-2} = 1$

0.0. $f_8(0) = 5 \quad (0; 5)$

$S(-2; 9)$



i) $f_g(x) = -2x^2 + 13x - 15$ $\quad a = -2 < 0$ concave ∩

$\triangle = 169 - 4 \cdot (-2) \cdot (-15) = 169 - 120 = 49$

$x_1 = \frac{-13 + \sqrt{49}}{2 \cdot (-2)} = \frac{-6}{-4} = \frac{3}{2} = 1{,}5$

$x_2 = \frac{-13 - 7}{-4} = \frac{-20}{-4} = 5$

$S\left(\frac{-13}{-4}; \frac{-49}{-8}\right)$ $\quad S(3{,}25; 6{,}125)$

0.0. $f_g(0) = -15$ $\quad (0; -15)$

