

Lösungen zu den Kurvendiskussionen

a) $f(x) = x^3 - 3x^2$

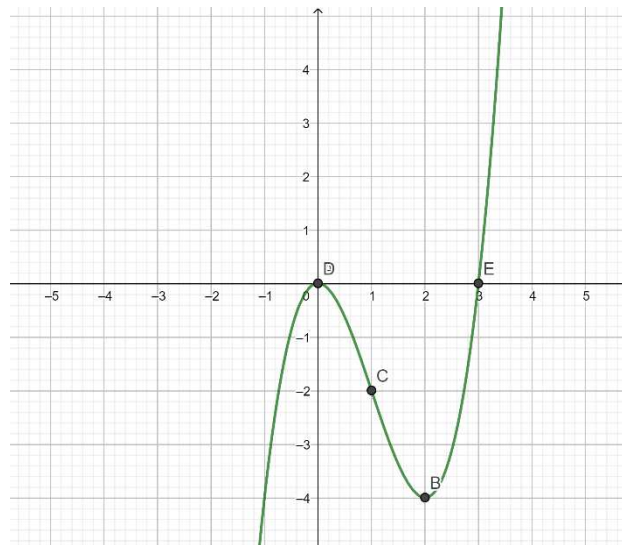
Nullstellen: $x_1=0, x_2=3$

Extrema: HP (0|0), TP (2|-4)

Wendepunkt WP (1|-2)

$$\lim_{x \rightarrow \infty} f(x) = \infty, \lim_{x \rightarrow -\infty} f(x) = -\infty$$

keine Symmetrie



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

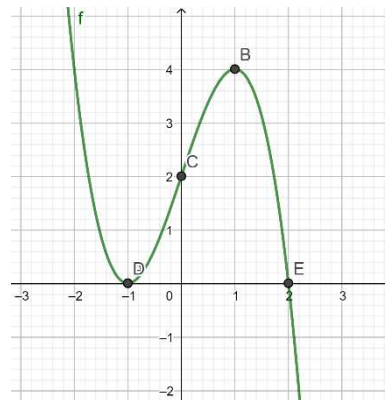
Nullstellen: $x_1 = -1, x_2 = 2$

Extrema: HP (1|4), TP (-1|0)

Wendepunkt WP (0|2)

$$\lim_{x \rightarrow \infty} f(x) = -\infty, \lim_{x \rightarrow -\infty} f(x) = \infty$$

keine Symmetrie (bzw. Punktsymm. zu (0|2))



c) $f(x) = 0.5x^3 - 3x^2 + 5x$

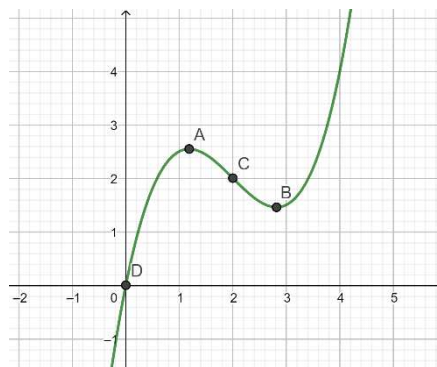
Nullstellen: $x_1 = 0$

Extrema: HP (1.18|2.54), TP (2.82|1.46)

Wendepunkt WP (2|2)

$$\lim_{x \rightarrow \infty} f(x) = \infty, \lim_{x \rightarrow -\infty} f(x) = -\infty$$

keine Symmetrie



d) $f(x) = 4x^3 + 5x^2 - 6x$

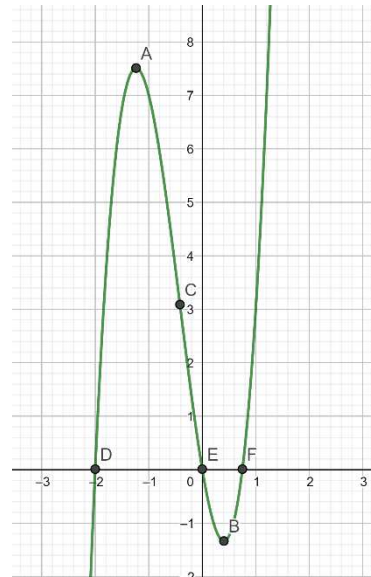
Nullstellen: $x_1 = -2, x_2 = 0, x_3 = 0,75$

Extrema: HP $(-1,24 | 7,5)$, TP $(0,4 | -1,34)$

Wendepunkt WP $(-0,42 | 3,08)$

$$\lim_{x \rightarrow \infty} f(x) = \infty, \lim_{x \rightarrow -\infty} f(x) = -\infty$$

keine Symmetrie



e) $f(x) = x^4 - 4x^3 + 4x^2$

Nullstellen: $x_1 = -2, x_2 = 0, x_3 = 0,75$

Extrema: TP $(0 | 0)$, HP $(1 | 1)$, TP $(2 | 0)$

Wendepunkt WP $(0,42 | 0,44)$ und WP $(1,58 | 0,44)$

$$\lim_{x \rightarrow \infty} f(x) = \infty, \lim_{x \rightarrow -\infty} f(x) = \infty$$

keine Symmetrie

