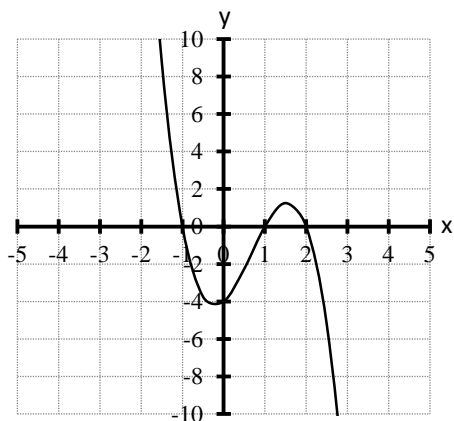


4.5. Aufgaben zur Faktorisierung ganzrationaler Funktionen

Bestimme jeweils eine mögliche Gleichung der abgebildeten Funktion f und skizziere den Graphen von g ebenfalls ein:

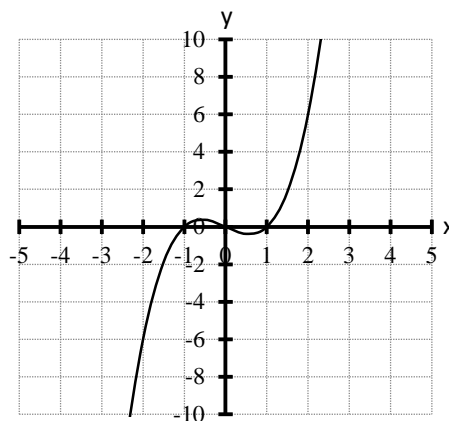
a) $g(x) = x^3 - x^2 - 2x$

$f(x) =$



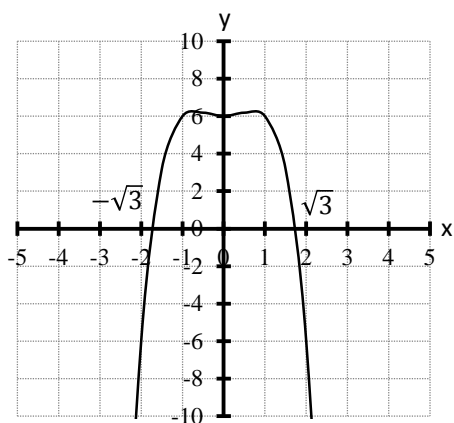
b) $g(x) = -x^3 - 4x^2 - 3x$

$f(x) =$



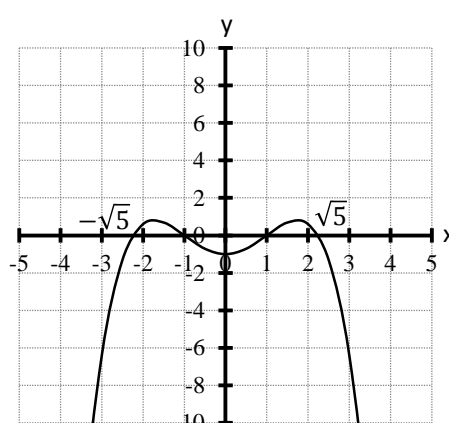
c) $g(x) = \frac{1}{32}x^4 - \frac{7}{16}x^2 - 1$

$f(x) =$



d) $g(x) = x^4 - 2x^2 - 8$

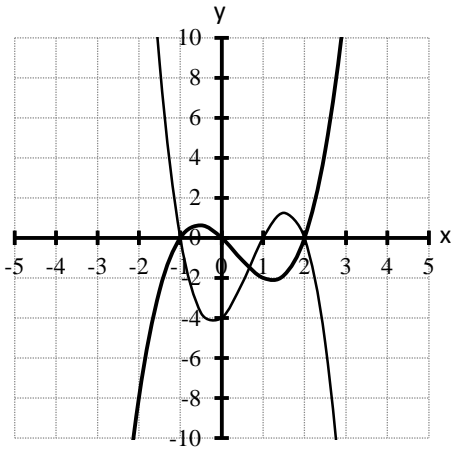
$f(x) =$



4.5. Lösungen zu den Aufgaben zur Faktorisierung ganzrationaler Funktionen

a) $g(x) = x^3 - x^2 - 2x = x(x+1)(x-2)$

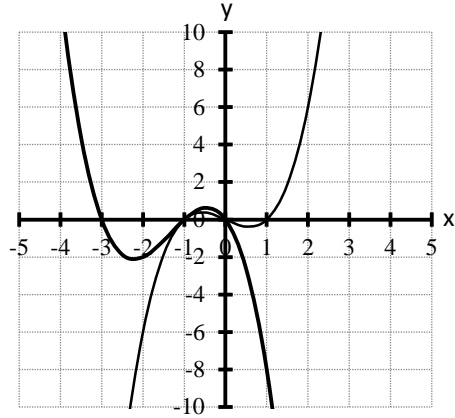
$f(x) = -2(x+1)(x-1)(x-2) = -2x^3 + 4x^2 + 2x - 4$



b) $g(x) = -x^3 - 4x^2 - 3x = -x(x+1)(x+3)$

$f_t(x) = tx(x-1)(x+1) = tx^3 - tx$ mit $t > 0$

z.B. $f_1(x) = x(x-1)(x+1) = x^3 - x$



c) $g(x) = \frac{1}{32}x^4 - \frac{7}{16}x^2 - 1 = \frac{1}{32}(x^2+2)(x-4)(x+4)$ d) $g(x) = x^4 - 2x^2 - 8 = (x^2+2)(x-2)(x+2)$

$f_t(x) = -t(x^2 + \frac{2}{t})(x^2 - 3) = -tx^4 + (3t - 2)x^2 + 6$

mit $t > 0$

z.B. $f_1(x) = -(x^2 + 2)(x^2 - 3) = -x^4 + x^2 + 6$

$f_t(x) = -t(x^2 + \frac{1}{5t})(x^2 + 5) = -tx^4 - (5t + \frac{1}{5})x^2 - 1$

mit $t > 0$

z.B. $f_1(x) = -\frac{1}{5}(x^2 + 1)(x^2 + 5) = -\frac{1}{5}x^4 - \frac{6}{5}x^2 - 1$

