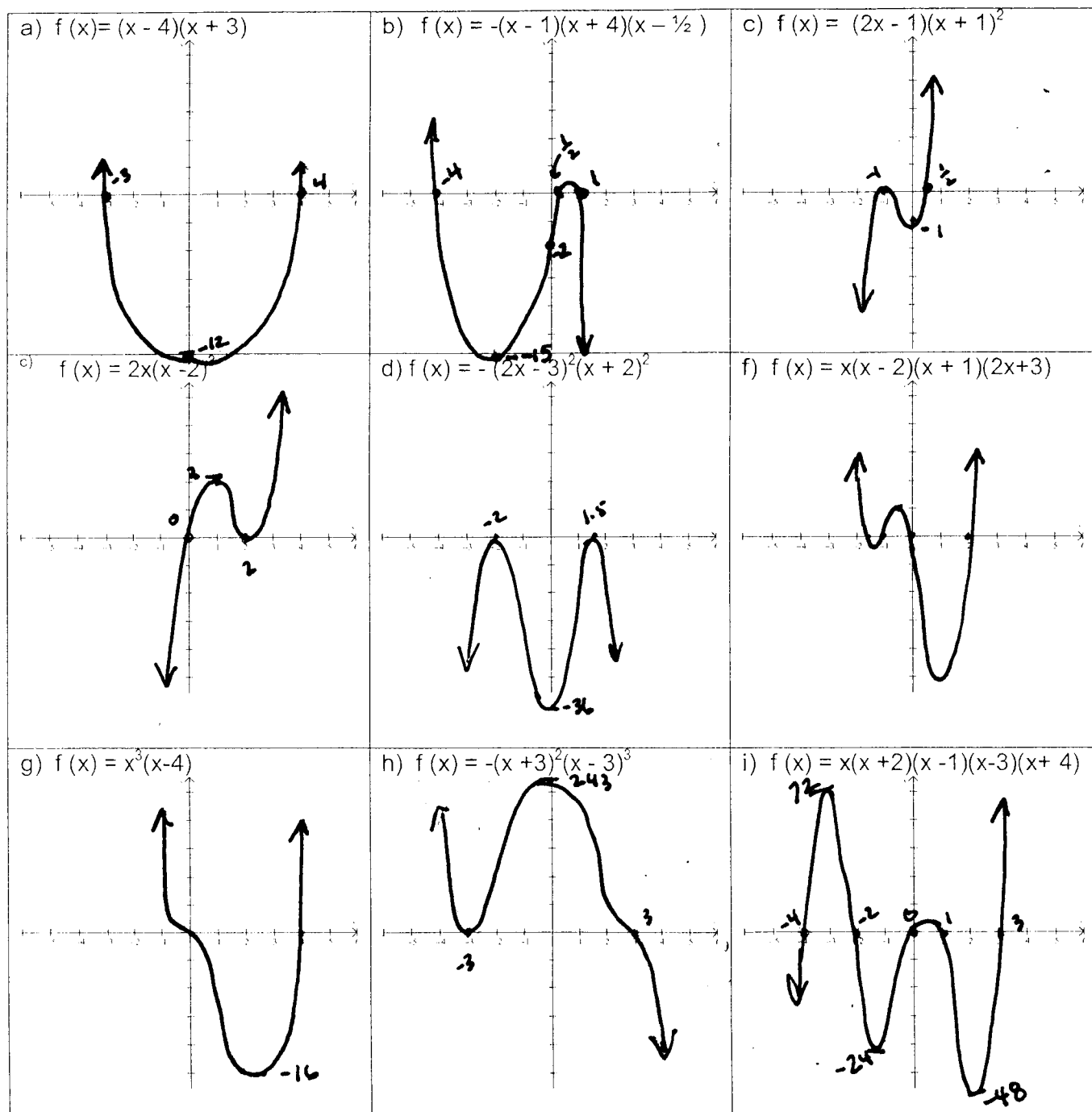# Factoring in our Graphs

Draw a sketch of each graph using the properties of polynomial functions. After you complete each sketch, check with your partner, discuss your strategies and make any corrections needed.

a) $f(x) = (x-4)(x+3)$	b) $f(x) = -(x-1)(x+4)(x-\frac{1}{2})$	c) $f(x) = (2x-1)(x+1)^2$
c) $f(x) = 2x(x-2)^2$	d) $f(x) = -(2x-3)^2(x+2)^2$	f) $f(x) = x(x-2)(x+1)(2x+3)$
g) $f(x) = x^3(x-4)$	h) $f(x) = -(x+3)^2(x-3)^3$	i) $f(x) = x(x+2)(x-1)(x-3)(x+4)$

Answers for next page:
1a) $(x+6)(2x+1)(2x-1)$ b) $-(x+7)^2(x-6)$ c) $-x^3(x-4)$ d) $-(x+3)^2(x-4)^2$ e) $(x+2.5)(x-3)^3$
f) $-(x+4)((x+2)(x+1)(x-3)^2(x-4)$ 2a) $f(x) = (x-4)^2(x+3)$ b) $y = (x-2)^3(x-5)$
c) $g(x) = (2x-1)(4x-3)(x+1)$ d) $y = -(x+2)(x-3)^2$ e) $f(x) = -(x+10)^2(x-10)^2$ 4. $y = -2(x+3)(x+1)(x-2)$
5. $f(x) = (x+1)^2(x-2)^2$, $g(x) = a(x+1)^2(x-2)^2$, answers may vary   6. At a zero with odd order the function changes sign at the zero (order 1 it passes directly through the zero, order 3 it inflects at the zero) and at a zero with even order the function does not change sign (just touches the x-axis creating a local max or min.). The sum of the orders is the degree of the polynomial.