

## Factoring a Polynomial by Using Its Graph I - KEY

Give a possible factorization of the following polynomials. Do NOT multiply out the factors! Be sure to use your knowledge of the Leading Coefficient Test and Repeated Zeros.

$$\begin{aligned} 1) \quad f(x) &= -(x + 4)x(x - 1) \\ &= -x(x + 4)(x - 1) \end{aligned}$$

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

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

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

$$5) \quad f(x) = -(x + 5)(x + 2)(x - 1)$$

$$\begin{aligned} 6) \quad f(x) &= -(x + 2)^3x^2(x - 1)^2(x - 2) \\ &= -x^2(x + 2)^3(x - 1)^2(x - 2) \end{aligned}$$

$$\begin{aligned} 7) \quad f(x) &= (x + 1)^3x(x - 2) \\ &= x(x + 1)^3(x - 2) \end{aligned}$$

$$8) \quad f(x) = (x + 2)(x - 1)^3(x - 3)^2$$

$$9) \quad f(x) = -2(x - 3)^2 + 5$$