Section 2.3 Polynomial Functions- Finding zeros

Find the zeros of each algebraically.

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

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

$0 = x(3x + 2)(x - 1)$

$x = 0$

$x = -\frac{2}{3}$

$x = 1$

2) $f(x) = 9x^2 - 3x - 2$

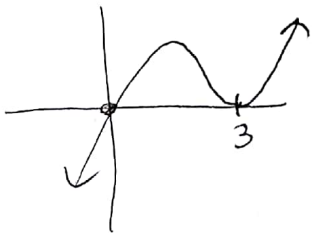
$0 = (3x + 1)(3x - 2)$

$x = -\frac{1}{3}$ $\quad$ $x = \frac{2}{3}$

State the degree and list the zeros of the polynomial function. State the multiplicity of each zero and whether the graph crosses the x-axis at the corresponding x-intercept. Then sketch the graph by hand.

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

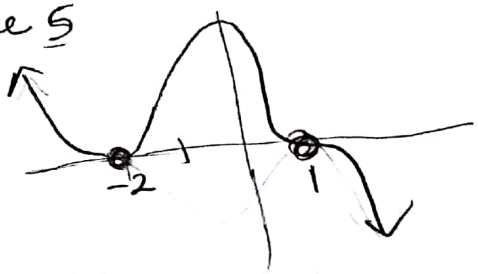
$x = 0$ ↑ crosses x-axis $\quad$ $x = 3$ ← mult. 2 tangent to x-axis



4) $f(x) = -(x-1)^3(x+2)^2$ degree 5

$x = 1$ mult. 3 crosses flattens

$x = -2$ mult 2 tangent



5) Using only algebra, Find a cubic function with zeros 3,-4,6

$f(x) = (x-3)(x+4)(x-6)$

$(x^2 + x - 12)(x - 6)$

$x^3 + x^2 - 12x$

$-6x^2 - 6x + 72$

$f(x) = x^3 - 5x^2 - 18x + 72$