B) Degree 3 with 5, 1/3, and 2/3 as zeros

$x = 5 \quad x = \frac{1}{3} \quad x = \frac{2}{3}$

$(x-5)(x-\frac{1}{3})(x-\frac{2}{3})$

$(x-5)(x^2-\frac{2}{3}x-\frac{1}{3}x+\frac{2}{9})$

$(x-5)(x^2-x+\frac{2}{9})$

$x^3-x^2+\frac{2}{9}x$

$-5x^2-5x-\frac{10}{9}$

$x^3-6x^2-\frac{43}{9}x-\frac{10}{9}$

Write a polynomial function of minimum degree in factored form with real coefficients whose zeros and their multiplicities include those listed. Then sketch a graph and discuss what you notice.

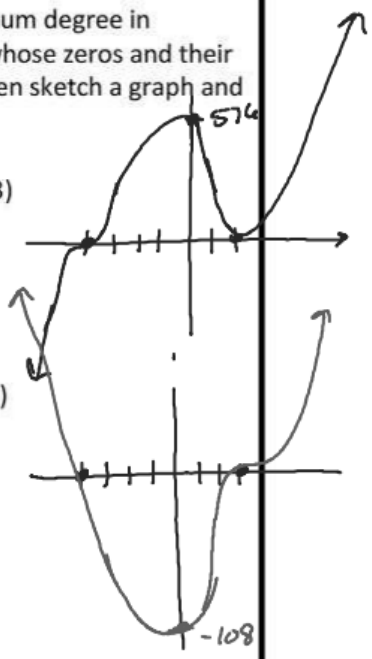
a) 3 (multiplicity 2), - 4 (multiplicity 3)

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

$(0-3)^2(0+4)^3$

$(9)(64)$

576



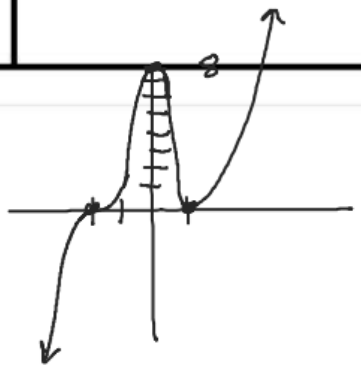
b) 3 (multiplicity 3), - 4 (multiplicity 1)

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

Y-intercept (0, 108)

1 (multiplicity 2), -2 (multiplicity 3)

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



$(x+1)(x+1)(x+1)(x-3)$

$(x^2+2x+1)(x^2-2x-3)$

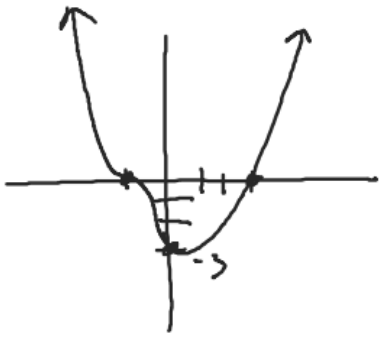
$x^4-2x^3-3x^2$

$2x^3-4x^2-6x$

x^2-2x-3

x^4-6x^2-8x-3

-1 (multiplicity 3), 3 (multiplicity 1) (Also write in Standard Form) $(x+1)^3(x-3)$



$$
\begin{array}{r}
6512 \\
5\overline{)32561} \\
-30 \\
\hline
25 \\
25 \\
\hline
06 \\
5 \\
\hline
11 \\
10 \\
\hline
1
\end{array}
$$

$6512\frac{1}{5}$