Eg: $f(x) = -2(x+3)^2(x-5)$

Sketch the graph of f following the above guidelines

(1) x-intercepts (zeros)

$-2(x+3)^2(x-5) = 0$

$x = -3$; $x = 5$

mult. 2 mult. 1

x-intercepts: $(-3, 0)$, $(5, 0)$

y-intercept: Set $x = 0$; $f(0) = -2 \cdot (0+3)^2 (0-5)$

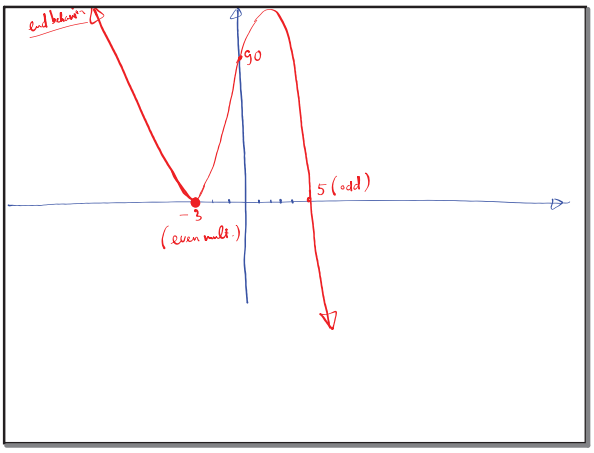
$= -2 \cdot 9 \cdot (-5) = 90$

$(0, 90)$

(2) End behavior

Leading term: $-2x^3$

Oct 25-10:42 AM



Oct 25-10:48 AM

E.g. $f(x) = \frac{1}{4} x (x-1)^4 (x+3)^3$

Sketch a graph of f following the guidelines

(1) x-intercepts

$x = 0$; $x = 1$; $x = -3$

mult. 4 mult. 4 mult. 3

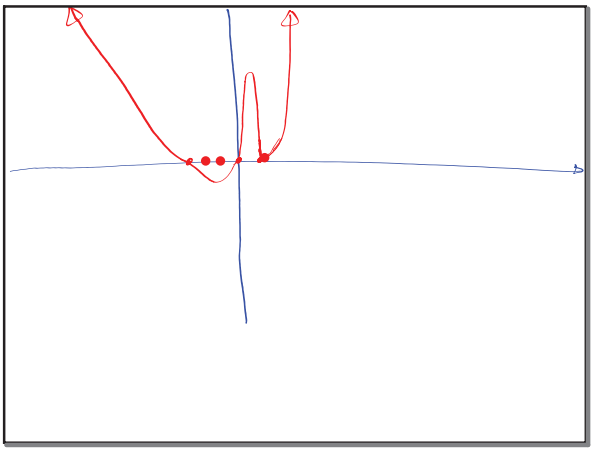
$(0,0)$; $(1,0)$; $(-3,0)$

y-intercept: $(0,0)$

(2) Leading term: $\frac{1}{4} x^8$

End behavior

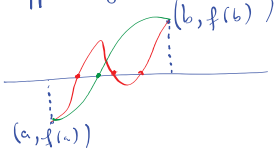
Oct 25-10:50 AM



Oct 25-11:01 AM

Intermediate Value Theorem

If f is a polynomial function, and $f(a)$ and $f(b)$ have opposite signs, then f has a zero on (a,b)



Oct 25-11:04 AM

E.g. $f(x) = x^3 - 5x^2 + 3x + 6$ on $[1,3]$

$f(1) = 5$; $f(3) = -3$

> 0 < 0

I.M.T says that f has a zero somewhere in $(1,3)$

Find the equation of a polynomial function.

E.g. Degree 4. Zeros (Roots) of multiplicity 2 at $x = \frac{1}{2}$; zero of mult. 1 at $x = 6$ and $x = -2$.

y-intercept at $(0, 18)$

Oct 25-11:09 AM