



$(x-1)^3$  The TraT  $x^3+1$

$$(x-1)(x-1)(x-1)$$

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

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

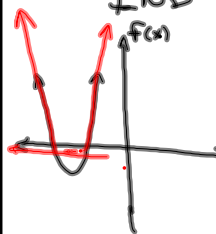
$$x^3 - 2x^2 + x - x^2 + 2x - 1$$

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

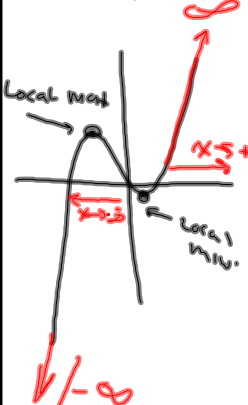
$$\frac{(x^4 - 64)}{(x^2 - 8)(x^2 + 8)} = \frac{(a^2 - b^2)}{(a+b)(a-b)}$$

$$\frac{(x^3 + x^2)(4x - 4)}{(x^2 - 4)(x + 1)} = \frac{(x+1)(x^2 - 4)(-4)(x+1)}{(x+2)(x-2)(x+1)}$$

End Behavior:  $2x^2 + x + 1$

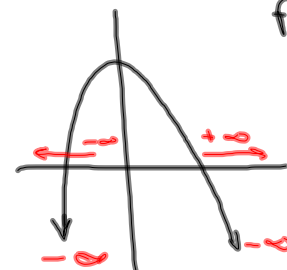


If  $a_n > 0$ , and  $N$  is even  
 $f(x) \rightarrow +\infty$  as  $x \rightarrow +\infty$   
 $f(x) \rightarrow +\infty$  as  $x \rightarrow -\infty$



If  $a_n > 0$ , and  $N$  is odd  
 $f(x) \rightarrow -\infty$  as  $x \rightarrow -\infty$   
 $f(x) \rightarrow +\infty$  as  $x \rightarrow +\infty$   
 $x^3 + 4x^2 + x + 2$

If  $a_n < 0$  and  $N$  is even  
 $f(x) \rightarrow -\infty$  as  $x \rightarrow -\infty$   
 $f(x) \rightarrow -\infty$  as  $x \rightarrow +\infty$   
 $-x^2 + 7x + 7$



If  $a_n < 0$  and  $N$  is odd  
 $f(x) \rightarrow +\infty$  as  $x \rightarrow -\infty$   
 $f(x) \rightarrow -\infty$  as  $x \rightarrow +\infty$   
 $-x^3 + 4x^2 + x + 2$

