

End Behavior – Zeroes and Multiplicities – Intermediate Value Theorem

End Behavior of a graph –

Leading Coefficient Test

Zeros of a polynomial function

$$P(x) = x^3 - 5x^2 - 4x + 20$$

Multiplicities –

$$P(x) = x^3 - 5x^2 - 4x + 20$$

$$(5,0) \quad (2,0) \quad (-2,0)$$

Multiplicity

$$f(x) = -3x^3(x-2)^4(x+7)^5(x-3)$$

Zeros

Multiplicity

Try it:  $f(x) = 3x(x+5)^6(x-4)^2(x-8)^9$

Zeros

Multiplicity

Intermediate Value Theorem –

Given that all of these points belong to the continuous function  $f(x)$ , determine if  $f(x)$  will ever equal zero.

x	f(x)
1	3
2	4
3	7
4	-1
5	-9
6	15

x	f(x)
1	-8
2	-1
3	-0.5
4	-7
5	-8
6	-7

x	f(x)
1	1
2	7
3	8
4	9
5	2
6	-0.00001