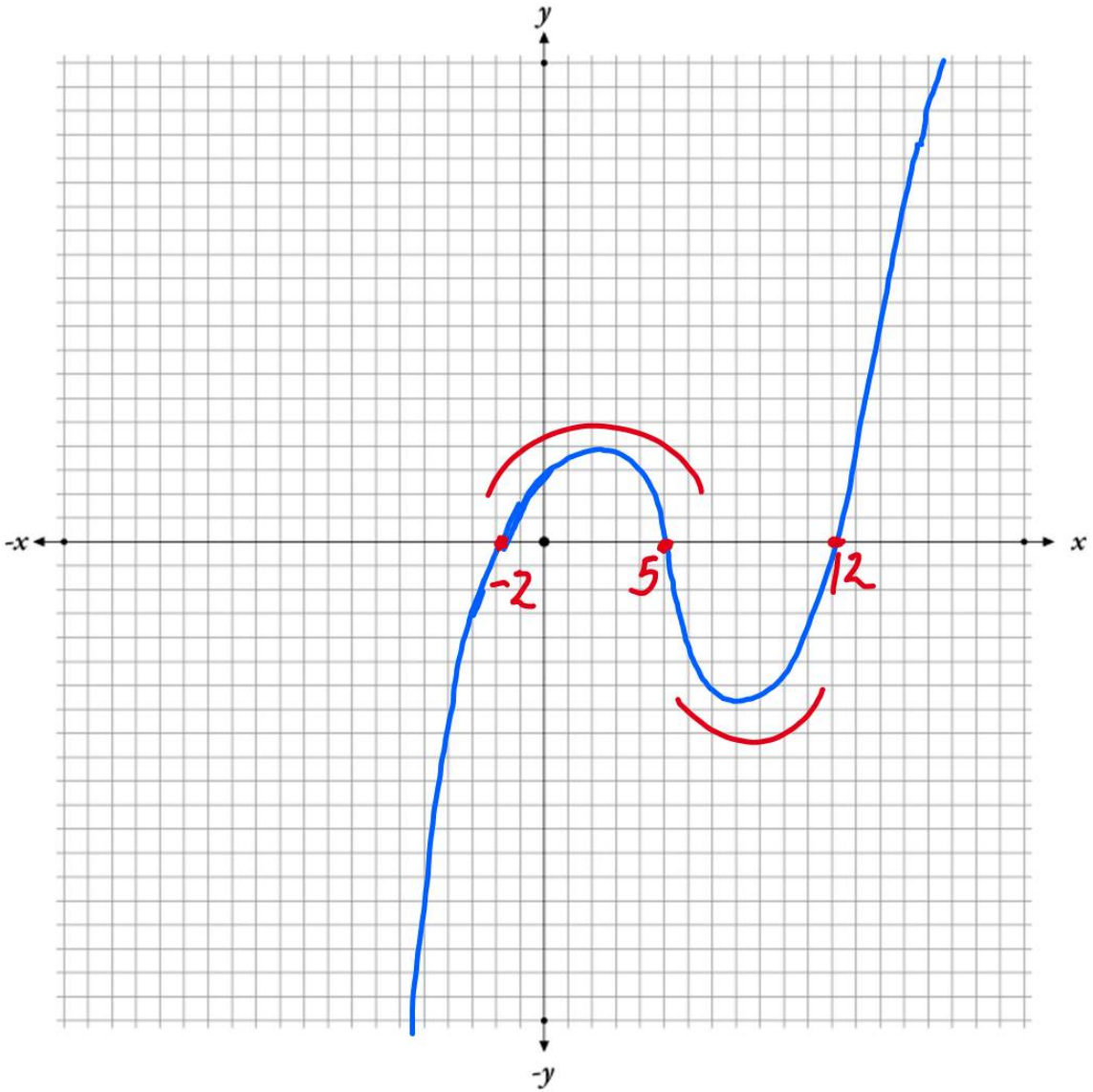
Find the following:

Roots: $-2, 5, 12$

Least Degree: 3

Even or Odd Degree: Odd

Positive or Negative LC: Positive



Characteristics of Polynomials:
Domain, Range, & Intercepts

Daily Questions…….

1. What is interval notation?

3. What is the domain & range of a function?

4. How do I find the intercepts of a functions graphically and algebraically?

How do we write in interval notation?

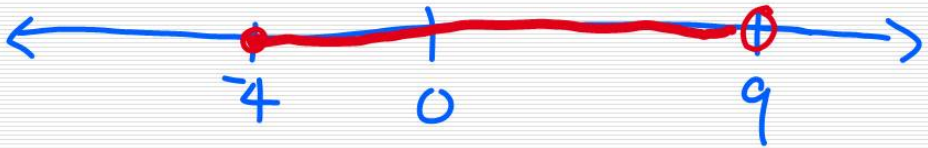
- $x < 2$….
- when you want *include* use a bracket [
- when you want to *exclude* use a parenthesis (

Let's draw a number line first….

Let's do another type....

$$-4 \leq x < 9$$

Draw a number line first....



$[-4, 9)$

Domain

- all the **x-values**
- Read the graph from left to right

Range

- all the y**-values**
- Read the graph from bottom to top

With polynomials….

- The **DOMAIN** is always All Reals, $(-\infty, \infty)$

- The **RANGE** will be:
  - All Reals, $(-\infty, \infty)$
  - Lower Boundary to infinity, $[LB, \infty)$
  - Negative infinity to Upper Boundary, $(-\infty, UB]$

What's a zero?

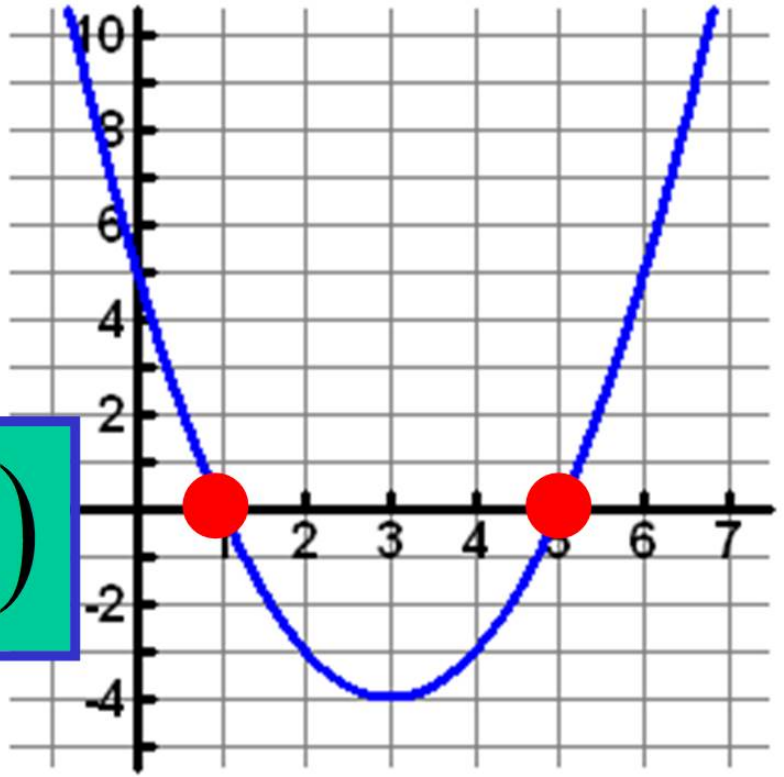
Zeros/x-intercepts/Solutions/Roots

Where the graph crosses the x-axis

Analyze the Graph of a Function

x-intercepts

Where the graph crosses the x-axis. Also called zeros.



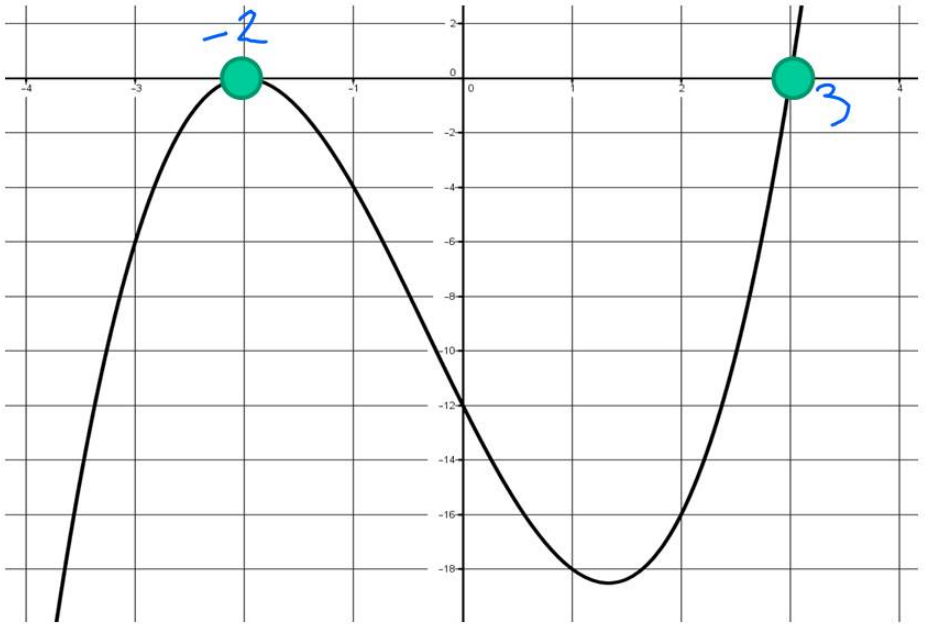
(1,0) & (5,0)

Zeros: 1, 5

X-Intercepts: (-2, 0) (-2, 0) (3,0)

Zeros, Roots:

x = -2 mult. 2, 3

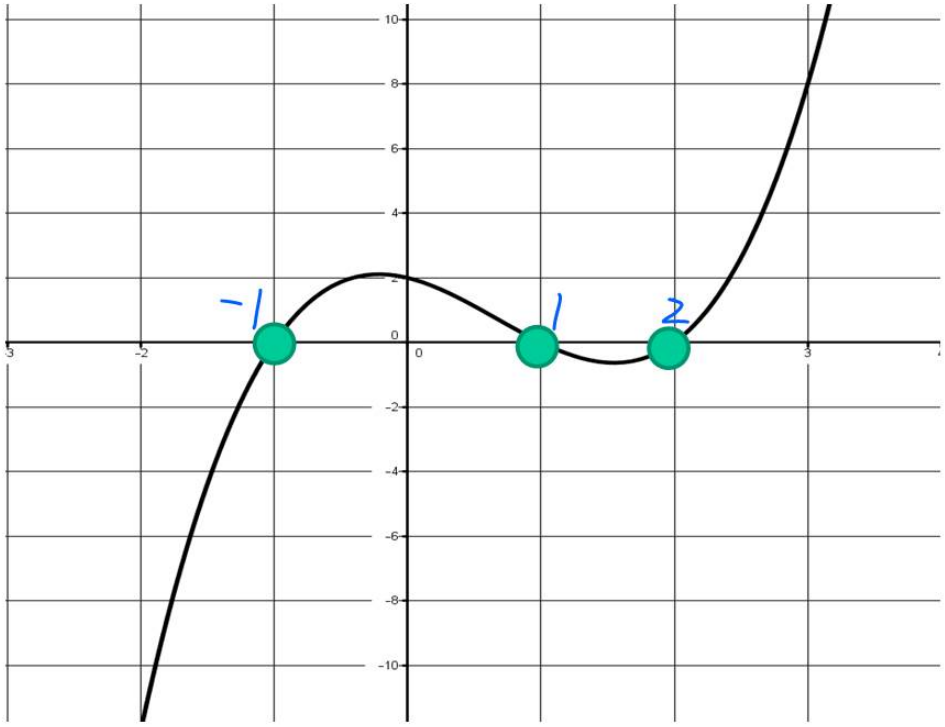


X-Intercepts – (-1 ,0)(1 ,0)(2,0)

Zeros, Roots

x = -1, 1, 2

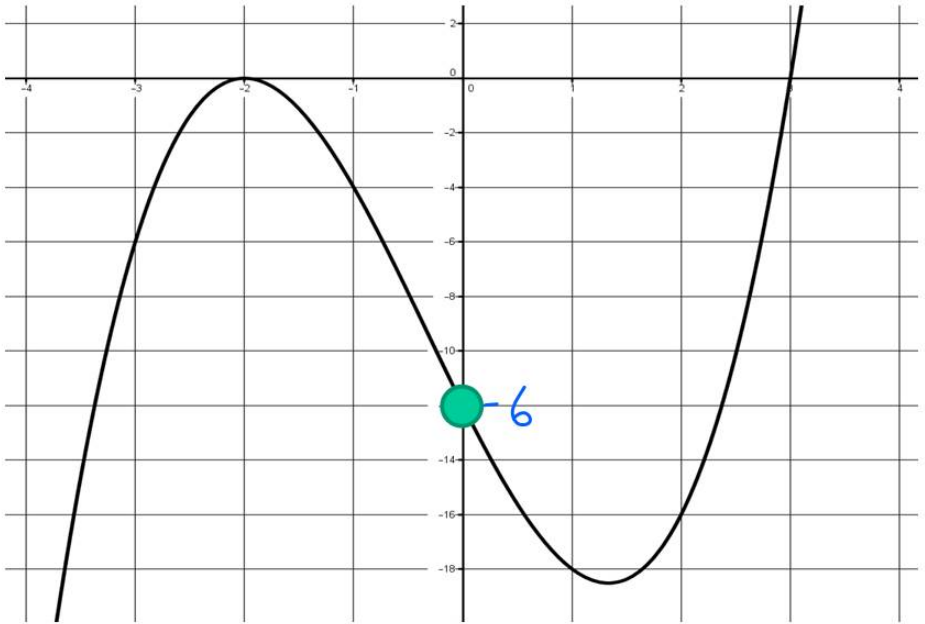
±1, 2



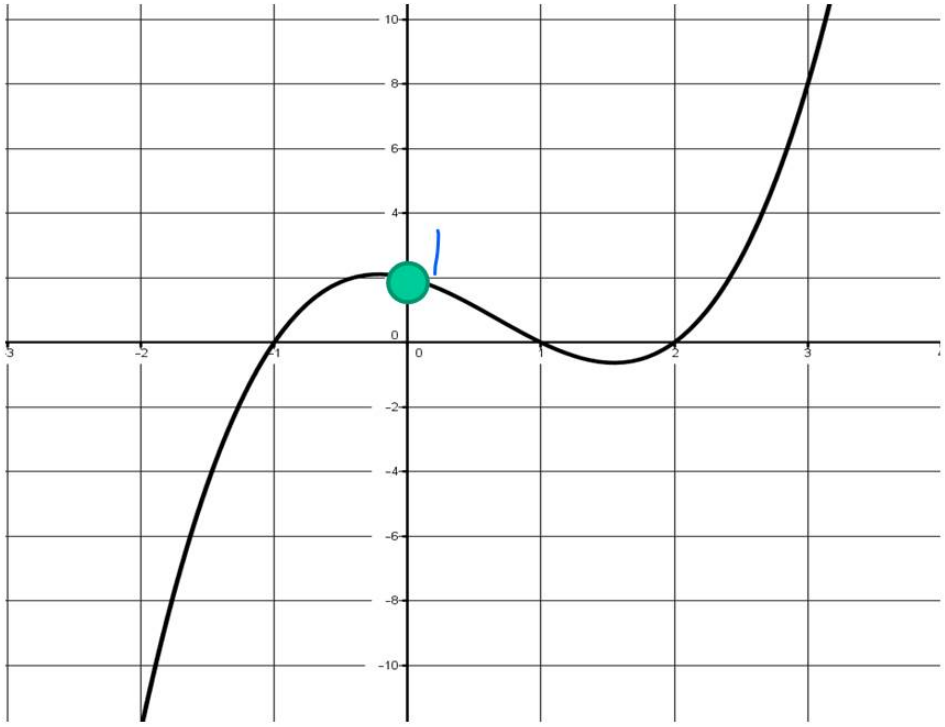
y-intercepts

Where the graph crosses the y-axis

y-Intercept: (0,-6)



y-Intercept: (0, 1)



Find the y-intercepts & number of zeros:

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

$3(0)^4 + 5(0)^2 - 1 = 0 - 1 = -1$

Y- int: (0, -1) **# of zeros: 4**

b) $f(x) = -2x^2 - 3x + 15$

$-2(0)^2 - 3(0) + 15 = 0 + 15 = 15$

Y- int: (0, 15) **# of zeros: 2**

Find the following

(L, R)

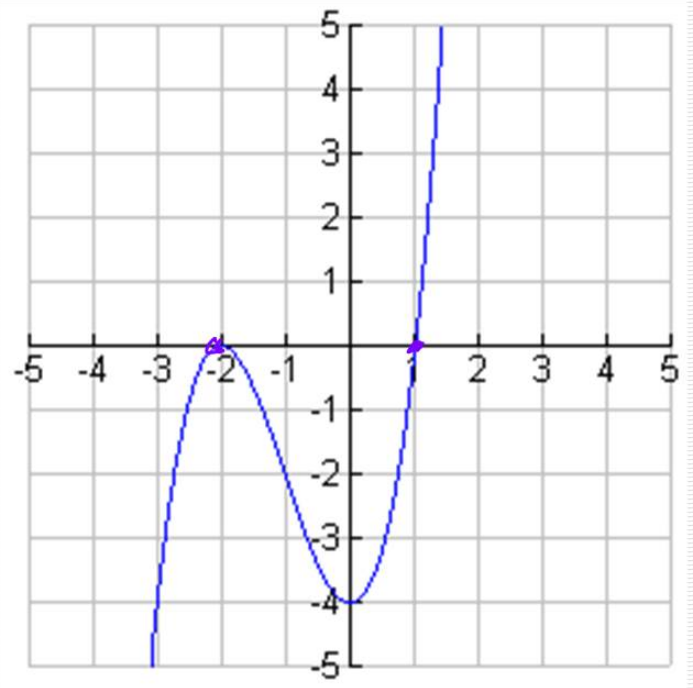
1. **Domain:** $(-\infty, \infty)$

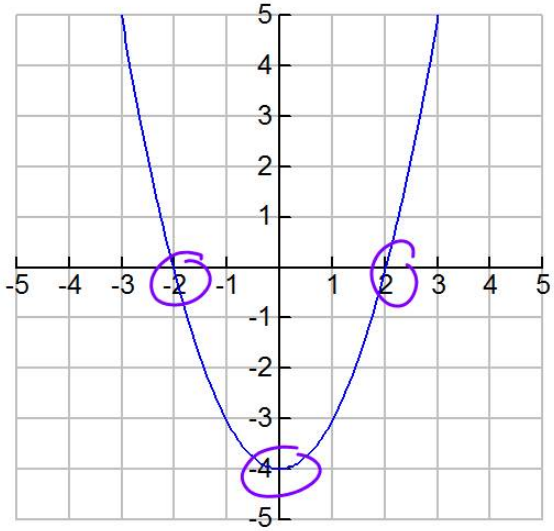
(Low, Hi)

2. **Range:** $(-\infty, \infty)$

3. **x-intercepts:** $-2_{\text{mult. } 2}, 1$

4. **y-intercepts:** -4



Find the following

1. **Domain:** $(-\infty, \infty)$
2. **Range:** $[-4, \infty)$
3. **Zeros:** $-2, 2$
4. **y-intercepts:** -4