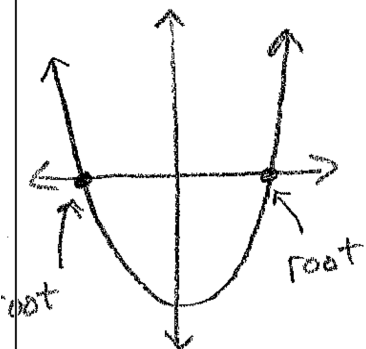


PC 2-1 Notes

Students will use roots and the multiplicity of the roots, the degree of the polynomial, and a point on the graph to write the equation of the corresponding polynomial.

X-Intercepts on a graph are the same as the **roots** of the polynomial. However, some **roots** are imaginary and won't appear as an x-intercept.



Roots of a polynomial are directly tied to the factors of the polynomial.

Example:
Roots: $x = 3, x = 9$

Factors: $(x-3)(x-9)$

The **degree** of a polynomial is the number that corresponds to the highest exponent of the given polynomial.

Example:
 $x^5 + 3x^2 + x + 7$

Degree: 5

A **root** has **multiplicity of m** (a number) when the exponent of the factor exists.

Example:
 $(x+3)(x-4)^2(x+5)^3$

Roots & Multiplicities:

$-3 ; 1$
 $4 ; 2$
 $-5 ; 3$

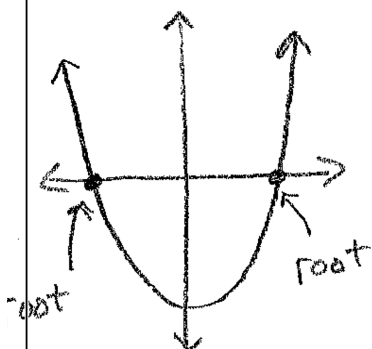
The following statements are equivalent:

- a) r is a root of the polynomial function f
- b) $(r, 0)$ is an x-intercept of the graph of f .
- c) $(x-r)$ is a factor of f .
- d) r is a solution the the equation $f(x) = 0$.

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