GUIDED NOTES: Classifying Polynomials, Zeroes and Multiplicity

Classifying Polynomials:

Degree: highest exponent

0	constant
1	linear
2	quadratic
3	cubic
4	quartic
5	quintic
6+	n^{th} degree

Number of Terms: separated by + and − signs

1	monomial
2	binomial
3	trinomial
4+	polynomial

EX1. $4x^3 - 7x$

degree: 3 → cubic

# of terms: 2 → binomial

EX2. $5x - 8x^2 - 4$

degree: 2 → quadratic

# of terms: 3 → trinomial

EX3. 12

degree: 0 → constant

# of terms: 1 → monomial

EX4. $19x^4 - 8x^2 + 3x - 6$

degree: 4 → quartic

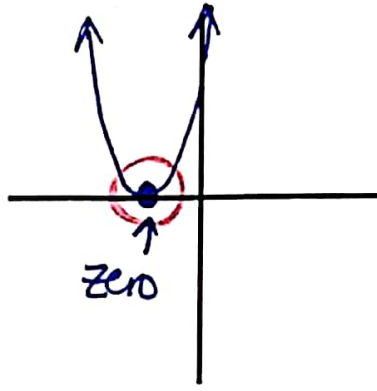# of terms: 4 → polynomial
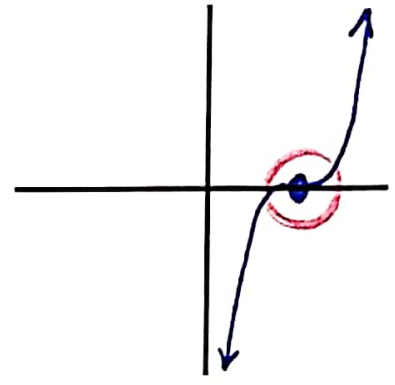
Zeroes and Multiplicity:

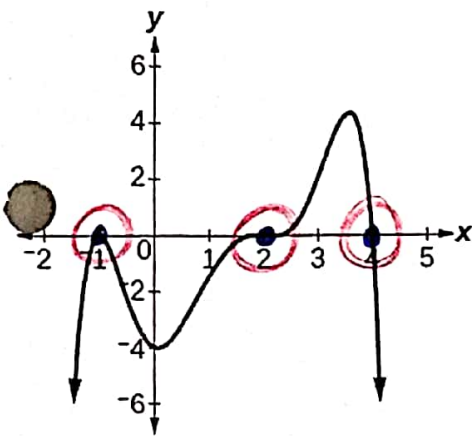zero — any number that makes an equation equal to 0.

multiplicity: 1

multiplicity: 2
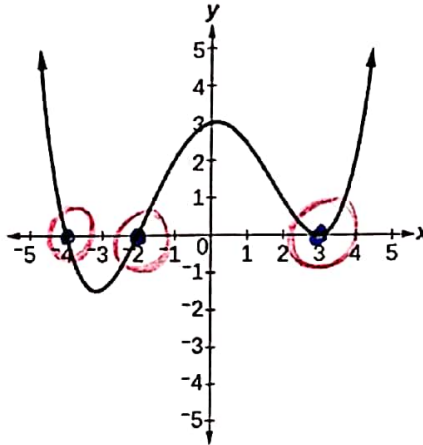"bounce"

multiplicity: 3
"flattens"
"squiggles"

EX5.

$X = -1$ mult: 2

$X = 2$ mult: 3

$X = 4$ mult: 1
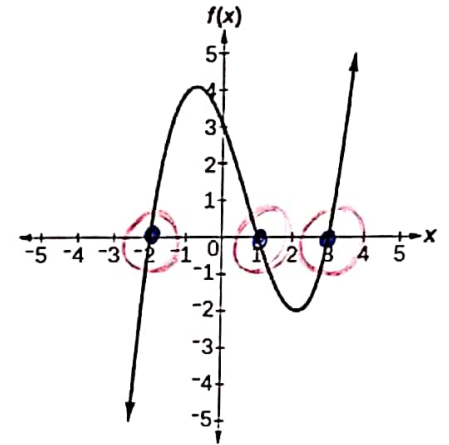
$+$ ─────

degree: 6

EX6.

$X = -4$ mult: 1

$X = -2$ mult: 1

$X = 3$ mult: 2

$+$ ─────

degree: 4

EX7.

$X = -2$ mult: 1

$X = 1$ mult: 1

$X = 3$ mult: 1

$+$ ─────

degree: 3

EX8. $f(x) = (x-4)^3(x-7)^1$

$X - 4 = 0$ $X - 7 = 0$
$+4 \quad +4$ $+7 \quad +7$
─────── ───────
$X = 4$ $X = 7$
mult: 3 mult: 1

degree: 4

EX9. $f(x) = 3x^2(2x+5)^1$

$\frac{3x}{3} = \frac{0}{3}$ $2x + 5 = 0$
$-5 \quad -5$
─────── ───────
$X = 0$ $\frac{2x}{2} = \frac{-5}{2}$
mult: 2 $X = -\frac{5}{2}$
 mult: 1

degree: 3

EX10. $f(x) = -9(x+6)^4(x-5)^2$

$X + 6 = 0$ $X - 5 = 0$
$-6 \quad -6$ $+5 \quad +5$
─────── ───────
$X = -6$ $X = 5$
mult: 4 mult: 2

degree: 6