Constant – double

Variable – char, Constant

Term – Dictionary<(Constant, Variable, Expression), Operand>

Expression – List<(Constant, Variable, Term)>

Fraction – (Constant, Variable, Term, Expression), (Constant, Variable, Term, Expression)

Multiplication

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Constant | Variable | Term | Expression | Fraction |
| Constant |  | new Term() | multiply out front | distribute through | multiply by numerator |
| Variable |  | new Term() | hash and check for collisions |
| Term |  |  |
| Expression |  |  |  | FOIL |
| Fraction |  |  | multiply out front (if constant) or do fraction multiplication |  |  |

Addition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Constant | Variable | Term | Expression | Fraction |
| Constant |  | new Expression() | new Expression() | check for like terms or add new term |  |
| Variable |  | new Term() (x+x = 2x) OR new Expression() (x+y = x+y) | increase coefficient (if like) OR new Expression() |
| Term |  |  |
| Expression |  |  |  |
| Fraction |  |  |  |  |  |