Global Collateral and Margin Management

Please write the code that will cover the following business requirements:

1. For all oil types listed in the Table 1:
    a) Given any price as the input, please calculate the Revenue yield,
    b) Given any price as the input, please calculate the Price-Earnings Ratio,
    c) Record a transaction with timestamp, quantity, buy or sell indicator and price,
    d) Calculate Volume Weighted Oil Price based on transaction in the past 30 minutes.
2. Calculate the Inventory Index using the geometric mean of prices for all the types of oil.

Expectations:

1. Please use Java 8+ language.
2. Please cover your code with unit testing (at least one end-to-end scenario using JUnit).
3. Please create a project using Maven or Gradle (ZIP file).
4. Please do not create any database but keep all data in memory.
5. Integration or Behavioral testing is not required, however, nice to have.

Table 1: Oil ID's.

Oil ID	Type	Fixed Revenue	Variable Revenue	Oil Barrel Value
AAC	Standard	1		42
REW	Standard	7		47
BWO	Standard	17		61
TIM	Premium	5	7%	111
QFC	Standard	22		123

Table 2: Formulas.

Type	Standard	Premium
Revenue Yield	$\frac{Fixed\ Revenue}{Price}$	$\frac{Variable\ Revenue\ .Oil\ Barrel\ Value}{Price}$
Price-Earnings Ratio	$\frac{Price}{Revenue}$	
Geometric Mean	$\sqrt[n]{p_1 p_2 p_3 \dots p_n}$	
Volume Weighted Oil Price	$\frac{\sum_i Price_i \times Quantity_i}{\sum_i Quantity_i}$	