

Analysis of Formula Evaluation Bug

Problem

User reports that formula `Qty*(Thickness_in_Inch/12)/27*(Slope___/100+1)` is not evaluating correctly; instead it shows only the total of Qty.

Root Cause

The `evaluateFormula` function in `utils/math.ts` uses `new Function(...argNames, 'return ' + formula)` where `argNames` are the keys of a variables map. This map includes both raw property names (e.g., "Thickness in Inch") and sanitized names (e.g., "Thickness_in_Inch"). Raw property names containing spaces or special characters are **invalid JavaScript identifiers**, causing a syntax error when the function is constructed. The error is caught and the function falls back to returning the raw Qty.

Additional Issues

1. `replaceLabelsWithVars` may not replace labels correctly if the formula already uses sanitized names (which is fine).
2. `sanitizeFormula` removes spaces, which could break variable names that contain spaces (but they should have been replaced earlier).
3. The variable mapping includes duplicate entries (raw and sanitized) which is unnecessary.

Proposed Fix

Modify `evaluateFormula` to only include valid JavaScript identifiers as argument names. This can be done by filtering `Object.keys(variables)` using a regex `^[a-zA-Z_$][a-zA-Z0-9_$]*$`. Alternatively, we can simply **not add raw property names** to the variables map, only adding the sanitized names.

Option 1: Filter invalid identifiers

In the `try` block, before constructing `argNames`, filter out keys that are not valid identifiers.

Option 2: Only add sanitized names

Change the property iteration to:

```
if (item.properties) {
  item.properties.forEach(prop => {
    const safeName = toVariableName(prop.name);
    variables[safeName] = prop.value;
  });
}
```

This ensures all variable keys are valid identifiers. However, this would break formulas that reference the raw property name (with spaces). Since `replaceLabelsWithVars` should have already converted raw

labels to sanitized names, and `sanitizeFormula` removes spaces, it's safe to assume that raw names are not needed.

We also need to update `replaceLabelsWithVars` to ensure it replaces raw labels with sanitized names (it already does). However, note that `variableSuggestions` in `PropertiesModal` uses `toVariableName(p.name)` as the `value`. That's correct.

Testing

We should test the fix with a sample item:

- Properties: `{ name: "Thickness in Inch", value: 4 }, { name: "Slope %", value: 5 }`
- Formula: `Qty*(Thickness_in_Inch/12)/27*(Slope_/100+1)`
- Qty: 100 (for example)

Expected result: $100 * (4/12) / 27 * (5/100 + 1) \approx 100 * 0.3333 / 27 * 1.05 \approx 1.296$. We can verify.

Implementation Steps

1. Switch to Code mode.
2. Edit `utils/math.ts` lines 137-145 to only add sanitized names (or filter invalid identifiers).
3. Ensure no regression by checking other usages (sub-items, price, etc.).
4. Test the fix manually in the application.

Recommendation

Proceed with Option 2 (only sanitized names) as it's simpler and aligns with the variable naming convention used elsewhere.

Let me know if you'd like to implement this fix.