RPN Worksheet 2 (Reverse Polish Notation)

Name: _____ **Date:** _____

Solve the following problems using techniques learned last class.

Questions

1. Evaluate an RPN expression

Evaluate:

```
7 2 + 3 4 * 2 / -
```

Answer: _____

2. Convert to RPN

Convert the algebraic expression **(5 + 3) × 4 - 6** to RPN notation.

Answer: _____

3. Convert to algebraic notation

Convert `a b + c d * e / -` to standard algebraic notation.

Answer: _____

4. Evaluate an RPN expression

Evaluate:

```
8 3 2 * + 5 4 - 6 * 2 / +
```

Answer: _____

5. Convert to RPN

Convert the algebraic expression **((a + b) × c - d) / (e + f × g)** to RPN notation.

Answer: _____

6. Convert to algebraic notation

Convert `x y z * + w v u * - / t +` to standard algebraic notation.

Answer: _____

7. Evaluate an RPN expression

Use degrees for trigonometric functions. Evaluate:

```
90 sin 4 sqrt * 16 4 / 2 ^ +
```

Answer: _____

8. Convert to RPN

Convert the algebraic expression $\sqrt{a^2 + b^2} \cdot \cos\theta$ to RPN notation.

Answer: _____

Challenge 1.

Write the RPN expression `5 4 3 2 1 - - - -` in standard infix notation

a. Using parenthesis
b. Without parenthesis

In both cases the numbers must appear in the original order but you may use any operands needed

Answer A: _____

Answer B: _____

Challenge 2.

An RPN expression with n operands and only binary operators $+, -, \times, \div$ will have how many operators?

Answer: _____

Challenge 3.

By reordering operators and/or operands, how many RPN expressions are equivalent to `4 3 2 1 + + +`? For example `1 2 3 4 + + +` has the same value

Answer: _____

Challenge 4.

Evaluate

```
1000 999 998 ... 3 2 1 - - - ... - -
```

Where there are the appropriate number of minus signs, and the three dots indicate missing values.

Answer: _____

Challenge 5.

Evaluate in radians.

```
1 cos cos cos cos ...
```

Where there are infinitely many cosines.

Answer: _____