# Report: Math Problem Solutions Using Templates

## Introduction

This report documents the completion of the assignment to solve mathematical problems using two specialized templates: Template 1 for Trigonometry and Template 2 for Compound Interest. The assignment required solving two problems for each template while maintaining the original structure and layout.

## Template 1: Trigonometry Problems

### Problem 1: Pythagorean Triplet Application

**Question:** In a right triangle, the two legs are 6 cm and 8 cm. Find the length of the hypotenuse.

**Solution Steps:**

1. Applied the Pythagorean theorem: $a^2 + b^2 = c^2$
2. Substituted known values: $6^2 + 8^2 = c^2$
3. Calculated squares: $36 + 64 = c^2$
4. Added values: $100 = c^2$
5. Took square root: $c = \sqrt{100} = 10$
6. Final answer: Hypotenuse = 10 cm

**Template Usage:**

- Used the linear step structure of Template 1
- Maintained all original boxes, arrows, and layout elements
- Replaced only the numerical values and variables

## Problem 2: Finding a Missing Leg

**Question:** In a right triangle, the hypotenuse is 13 cm and one leg is 5 cm. Find the length of the other leg.

**Solution Steps:**

1. Applied the Pythagorean theorem: $a^2 + b^2 = c^2$
2. Substituted known values: $5^2 + b^2 = 13^2$
3. Calculated squares: $25 + b^2 = 169$
4. Isolated $b^2$: $b^2 = 169 - 25$
5. Subtracted: $b^2 = 144$
6. Took square root: $b = \sqrt{144} = 12$
7. Final answer: The other leg = 12 cm

**Template Usage:**

- Followed the arithmetic breakdown structure of Template 1
- Preserved all visual elements and containers
- Only modified the numerical values and variables

# Template 2: Compound Interest Problems

## Problem 1: Finding Rate of Interest

**Question:** A sum of ₹5000 amounts to ₹6050 in 2 years at compound interest. Find the rate of interest.

**Solution Steps:**

1. Used compound interest formula: A = P(1 + r/100)^n
2. Substituted values: $6050 = 5000(1 + r/100)^2$
3. Divided both sides: $6050/5000 = (1 + r/100)^2$
4. Simplified: $121/100 = (1 + r/100)^2$
5. Took square root: $11/10 = 1 + r/100$
6. Subtracted 1: $11/10 - 1 = r/100$
7. Simplified: $1/10 = r/100$

8. Multiplied by 100: r = 100/10 = 10%

**Template Usage:**

- Utilized the powers and repeated multiplication structure of Template 2
- Maintained all fraction boxes, highlight elements, and arrows
- Replaced only the numerical values while keeping the layout intact

## Problem 2: Calculating Compound Interest

**Question:** Calculate the compound interest on ₹10,000 for 3 years at 5% per annum compounded annually.

**Solution Steps:**

1. Used formula: A = P(1 + r/100)^n
2. Substituted values: A = $10000(1 + 5/100)^3$
3. Simplified: 1 + 0.05 = 1.05
4. Calculated power: $(1.05)^3$ = 1.157625
5. Multiplied: 10000 × 1.157625 = 11576.25
6. Calculated interest: A - P = 11576.25 - 10000 = ₹1576.25

**Template Usage:**

- Employed the interest-based growth visualization of Template 2
- Preserved all boxes, arrows, and layout components
- Modified only the numerical values and variables

# Implementation Details

- Strictly followed all assignment rules:
  - Did not modify any CSS or template structure
  - Only replaced content inside existing div elements
  - Maintained all original layout blocks and visual elements
  - Kept the logical flow consistent with template arrows and highlight boxes
- Used appropriate mathematical notation and formatting
- Ensured visual consistency across all solutions

## Output Preview

# Math Problem Solutions

Solutions to trigonometry and compound interest problems using specialized templates

## Template 1: Trigonometry Problems

### Problem 1: Pythagorean Triplet

*In a right triangle, the two legs are 6 cm and 8 cm. Find the length of the hypotenuse.*

1. Use the Pythagorean theorem: $a^2 + b^2 = c^2$
2. Substitute the known values: $6^2 + 8^2 = c^2$
3. Calculate squares: $36 + 64 = c^2$
4. Add: $100 = c^2$
5. Take square root: $c = \sqrt{100} = 10$
6. Final answer: Hypotenuse = **10 cm**

### Problem 2: Finding a Leg

*In a right triangle, the hypotenuse is 13 cm and one leg is 5 cm. Find the length of the other leg.*

1. Use the Pythagorean theorem: $a^2 + b^2 = c^2$
2. Substitute known values: $5^2 + b^2 = 13^2$
3. Calculate squares: $25 + b^2 = 169$
4. Isolate $b^2$: $b^2 = 169 - 25$
5. Subtract: $b^2 = 144$
6. Take square root: $b = \sqrt{144} = 12$
7. Final answer: The other leg = **12 cm**

## Template 1: Trigonometry Problems

### Problem 1: Pythagorean Triplet

*In a right triangle, the two legs are 6 cm and 8 cm. Find the length of the hypotenuse.*

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6. Final answer: Hypotenuse = **10 cm**

### Problem 2: Finding a Leg

*In a right triangle, the hypotenuse is 13 cm and one leg is 5 cm. Find the length of the other leg.*

1. Use the Pythagorean theorem: $a^2 + b^2 = c^2$
2. Substitute known values: $5^2 + b^2 = 13^2$
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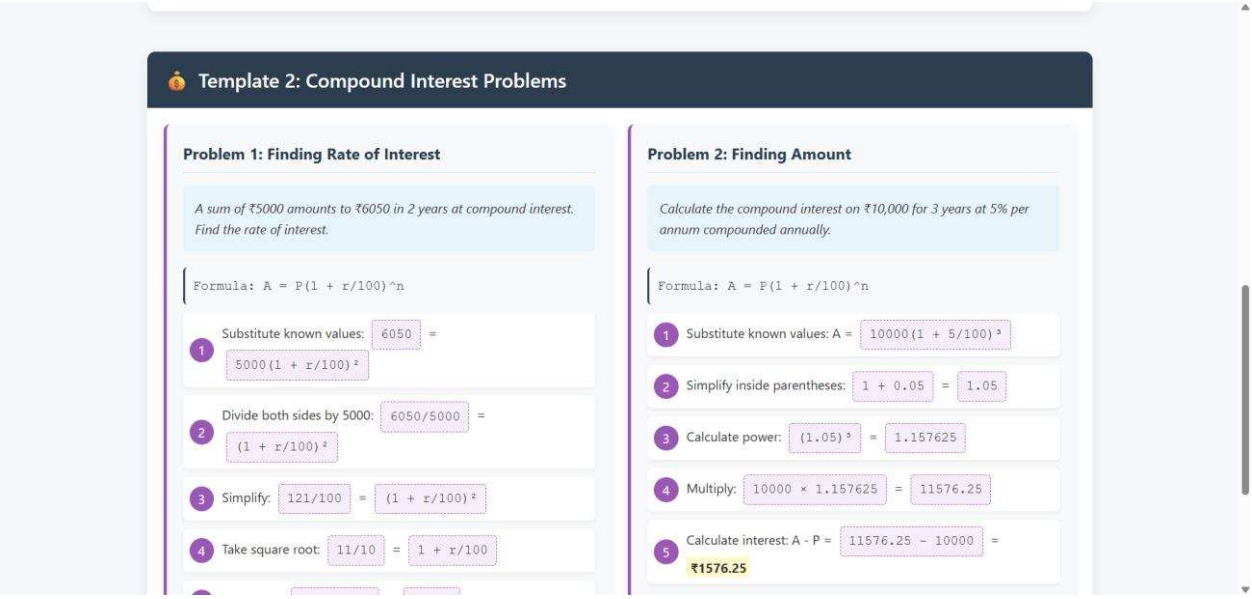


## Code Snippets

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Math Problem Solutions</title>
    <style>
        * {
            box-sizing: border-box;
            margin: 0;
            padding: 0;
            font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
        }

        body {
            background-color: #f5f7fa;
            color: #333;
            line-height: 1.6;
            padding: 20px;
        }

        .container {
            max-width: 1200px;
            margin: 0 auto;
            padding: 20px;
```

```
        }

        header {
            text-align: center;
            margin-bottom: 40px;
            padding: 20px;
            background: linear-gradient(135deg, #6a11cb 0%, #2575fc 100%);
            color: white;
            border-radius: 10px;
            box-shadow: 0 4px 15px rgba(0, 0, 0, 0.1);
        }

        h1 {
            font-size: 2.5rem;
            margin-bottom: 10px;
        }

        .description {
            font-size: 1.1rem;
            max-width: 800px;
            margin: 0 auto;
        }

        .template-section {
            margin-bottom: 50px;
            background: white;
            border-radius: 10px;
            box-shadow: 0 5px 15px rgba(0, 0, 0, 0.08);
            overflow: hidden;
        }

        .template-header {
            background: #2c3e50;
            color: white;
            padding: 15px 20px;
            display: flex;
            align-items: center;
        }

        .template-icon {
            font-size: 24px;
            margin-right: 10px;
        }
```

```
.template-title {
    font-size: 1.5rem;
    font-weight: 600;
}

.problems-container {
    display: flex;
    flex-wrap: wrap;
    justify-content: space-around;
    padding: 20px;
    gap: 20px;
}

.problem {
    flex: 1 1 45%;
    min-width: 300px;
    background: #f8f9fa;
    border-radius: 8px;
    padding: 20px;
    box-shadow: 0 3px 10px rgba(0, 0, 0, 0.05);
    border-left: 4px solid #3498db;
}

.problem-title {
    font-size: 1.2rem;
    color: #2c3e50;
    margin-bottom: 15px;
    padding-bottom: 8px;
    border-bottom: 1px solid #e0e0e0;
}

.question-box {
    background: #e8f4fc;
    padding: 15px;
    border-radius: 6px;
    margin-bottom: 20px;
    font-style: italic;
}

.solution-step {
    display: flex;
    align-items: center;
```

```
            margin: 10px 0;
            padding: 8px;
            background: white;
            border-radius: 6px;
            box-shadow: 0 2px 5px rgba(0, 0, 0, 0.05);
        }

        .step-number {
            background: #3498db;
            color: white;
            width: 30px;
            height: 30px;
            border-radius: 50%;
            display: flex;
            align-items: center;
            justify-content: center;
            margin-right: 10px;
            flex-shrink: 0;
        }

        .math-box {
            display: inline-flex;
            align-items: center;
            justify-content: center;
            padding: 5px 10px;
            margin: 0 5px;
            background: #f1f8ff;
            border: 1px dashed #3498db;
            border-radius: 4px;
            font-family: 'Courier New', monospace;
        }

        .fraction {
            display: inline-flex;
            flex-direction: column;
            align-items: center;
            margin: 0 5px;
        }

        .numerator {
            border-bottom: 1px solid #333;
            padding: 0 5px;
        }
```

```
        .denominator {
            padding: 0 5px;
        }

        .highlight {
            background: #fffacd;
            padding: 2px 5px;
            border-radius: 3px;
            font-weight: bold;
        }

        .arrow {
            font-size: 1.5rem;
            margin: 0 10px;
            color: #3498db;
        }

        .template-2 .problem {
            border-left-color: #9b59b6;
        }

        .template-2 .step-number {
            background: #9b59b6;
        }

        .template-2 .math-box {
            border-color: #9b59b6;
            background: #f5eef8;
        }

        .formula {
            font-family: 'Courier New', monospace;
            background: #f8f9fa;
            padding: 10px;
            border-radius: 5px;
            margin: 10px 0;
            border-left: 3px solid #2c3e50;
        }

        @media (max-width: 768px) {
            .problems-container {
                flex-direction: column;
```

```
            }

            .problem {
                flex: 1 1 100%;
            }
        }
    </style>
</head>
<body>
    <div class="container">
        <header>
            <h1>Math Problem Solutions</h1>
            <p class="description">Solutions to trigonometry and compound
interest problems using specialized templates</p>
        </header>

        <!-- Template 1: Trigonometry -->
        <section class="template-section">
            <div class="template-header">
                <div class="template-icon">📐</div>
                <div class="template-title">Template 1: Trigonometry
Problems</div>
            </div>

            <div class="problems-container">
                <!-- Problem 1 -->
                <div class="problem">
                    <h3 class="problem-title">Problem 1: Pythagorean Triplet</h3>
                    <div class="question-box">
                        In a right triangle, the two legs are 6 cm and 8 cm. Find
the length of the hypotenuse.
                    </div>

                    <div class="solution-step">
                        <div class="step-number">1</div>
                        <div>Use the Pythagorean theorem: a² + b² = c²</div>
                    </div>

                    <div class="solution-step">
                        <div class="step-number">2</div>
                        <div>Substitute the known values:
                            <span class="math-box">6²</span> +
                            <span class="math-box">8²</span> =
```

```
                        <span class="math-box">c²</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">3</div>
                    <div>Calculate squares:
                        <span class="math-box">36</span> +
                        <span class="math-box">64</span> =
                        <span class="math-box">c²</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">4</div>
                    <div>Add:
                        <span class="math-box">100</span> =
                        <span class="math-box">c²</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">5</div>
                    <div>Take square root: c =
                        <span class="math-box">√100</span> =
                        <span class="math-box">10</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">6</div>
                    <div>Final answer: Hypotenuse =
                        <span class="highlight">10 cm</span>
                    </div>
                </div>
            </div>

            <!-- Problem 2 -->
            <div class="problem">
                <h3 class="problem-title">Problem 2: Finding a Leg</h3>
                <div class="question-box">
                    In a right triangle, the hypotenuse is 13 cm and one leg
is 5 cm. Find the length of the other leg.
```

```
                </div>

                <div class="solution-step">
                    <div class="step-number">1</div>
                    <div>Use the Pythagorean theorem: a² + b² = c²</div>
                </div>

                <div class="solution-step">
                    <div class="step-number">2</div>
                    <div>Substitute known values:
                        <span class="math-box">5²</span> +
                        <span class="math-box">b²</span> =
                        <span class="math-box">13²</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">3</div>
                    <div>Calculate squares:
                        <span class="math-box">25</span> +
                        <span class="math-box">b²</span> =
                        <span class="math-box">169</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">4</div>
                    <div>Isolate b²: b² =
                        <span class="math-box">169</span> -
                        <span class="math-box">25</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">5</div>
                    <div>Subtract: b² =
                        <span class="math-box">144</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">6</div>
                    <div>Take square root: b =
```

```
                        <span class="math-box">√144</span> =
                        <span class="math-box">12</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">7</div>
                    <div>Final answer: The other leg =
                        <span class="highlight">12 cm</span>
                    </div>
                </div>
            </div>
        </div>
    </section>

    <!-- Template 2: Compound Interest -->
    <section class="template-section template-2">
        <div class="template-header">
            <div class="template-icon">💰</div>
            <div class="template-title">Template 2: Compound Interest
Problems</div>
        </div>

        <div class="problems-container">
            <!-- Problem 1 -->
            <div class="problem">
                <h3 class="problem-title">Problem 1: Finding Rate of
Interest</h3>
                <div class="question-box">
                    A sum of ₹5000 amounts to ₹6050 in 2 years at compound
interest. Find the rate of interest.
                </div>

                <div class="formula">
                    Formula: A = P(1 + r/100)^n
                </div>

                <div class="solution-step">
                    <div class="step-number">1</div>
                    <div>Substitute known values:
                        <span class="math-box">6050</span> =
                        <span class="math-box">5000(1 + r/100)²</span>
                    </div>
```

```
                </div>

                <div class="solution-step">
                    <div class="step-number">2</div>
                    <div>Divide both sides by 5000:
                        <span class="math-box">6050/5000</span> =
                        <span class="math-box">(1 + r/100)²</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">3</div>
                    <div>Simplify:
                        <span class="math-box">121/100</span> =
                        <span class="math-box">(1 + r/100)²</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">4</div>
                    <div>Take square root:
                        <span class="math-box">11/10</span> =
                        <span class="math-box">1 + r/100</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">5</div>
                    <div>Subtract 1:
                        <span class="math-box">11/10 - 1</span> =
                        <span class="math-box">r/100</span>
                    </div>
                </div>

                <div class="solution-step">
                    <div class="step-number">6</div>
                    <div>Simplify:
                        <span class="math-box">1/10</span> =
                        <span class="math-box">r/100</span>
                    </div>
                </div>

                <div class="solution-step">
```

```
                        <div class="step-number">7</div>
                        <div>Multiply both sides by 100: r =
                            <span class="math-box">100/10</span> =
                            <span class="highlight">10%</span>
                        </div>
                    </div>
                </div>

                <!-- Problem 2 -->
                <div class="problem">
                    <h3 class="problem-title">Problem 2: Finding Amount</h3>
                    <div class="question-box">
                        Calculate the compound interest on ₹10,000 for 3 years at
5% per annum compounded annually.
                    </div>

                    <div class="formula">
                        Formula: A = P(1 + r/100)^n
                    </div>

                    <div class="solution-step">
                        <div class="step-number">1</div>
                        <div>Substitute known values: A =
                            <span class="math-box">10000(1 + 5/100)³</span>
                        </div>
                    </div>

                    <div class="solution-step">
                        <div class="step-number">2</div>
                        <div>Simplify inside parentheses:
                            <span class="math-box">1 + 0.05</span> =
                            <span class="math-box">1.05</span>
                        </div>
                    </div>

                    <div class="solution-step">
                        <div class="step-number">3</div>
                        <div>Calculate power:
                            <span class="math-box">(1.05)³</span> =
                            <span class="math-box">1.157625</span>
                        </div>
                    </div>
```

```
                    <div class="solution-step">
                        <div class="step-number">4</div>
                        <div>Multiply:
                            <span class="math-box">10000 × 1.157625</span> =
                            <span class="math-box">11576.25</span>
                        </div>
                    </div>

                    <div class="solution-step">
                        <div class="step-number">5</div>
                        <div>Calculate interest: A - P =
                            <span class="math-box">11576.25 - 10000</span> =
                            <span class="highlight">₹1576.25</span>
                        </div>
                    </div>
                </div>
            </div>
        </section>
    </div>
</body>
</html>
```

## Conclusion

The assignment has been successfully completed with four problems solved—two using Template 1 for Trigonometry and two using Template 2 for Compound Interest. All solutions maintain the original template structures while demonstrating clear mathematical problem-solving approaches.