Note: You are allowed to use the trig formulas that I have given you.

1. (20 points) Solve for \(x, y, z\) the linear system:

\[
\begin{align*}
    x + y + z &= 7 \\
    -5x + 3y + 2z &= 1 \\
    2x - y + z &= 7
\end{align*}
\]

2. (20 points) Verify the identity:

\[
\frac{1}{1 - \cos(x)} + \frac{1}{1 + \cos(x)} = 2 \csc^2(x)
\]

3. (20 points) Solve for \(0 \leq x < 360^\circ\): \(\cos(2x) - \cos(x) + 1 = 0\)

   Hint: Express \(\cos(2x)\) in terms of the square of \(\cos(x)\) and solve the quadratic equation.

4. (20 points) In \(\triangle ABC\) side \(b = 8\), side \(c = 11\) and \(\angle B = 20^\circ\), \(\angle C = 30^\circ\). Find \(a\) to the nearest tenth.

5. (20 points) Given \(\sin A = \frac{1}{3}\) for \(A\) in Quadrant II, \(\cos B = -\frac{3}{5}\) in Quadrant III, find

   (i) \(\sin(A + B) = ?\)   (ii) \(\tan(2B) = ?\)

6. **Bonus Problems** (20 points)

   (A) Solve for \(x\): \(9^2x^5 = 27^{-x} - 8\)

   (B) Joe has $7.60 in quarters and dimes. If he has 55 coins, how many coins of each kind are there?