

YOUR NAME: \_\_\_\_\_

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Solve the compound linear inequality **in two variables**

$$2x + 3y \leq 9 \quad \text{or} \quad -3x + 2y \geq 6.$$

2. Solve the following  $3 \times 3$  system using **elimination**:  $\left\{ \begin{array}{rcl} x - 4y - z & = & 10 \\ 3x + 10y - 5z & = & 40 \\ -2x + y + 6z & = & -3 \end{array} \right\}.$

3. Once upon a time, there were two brothers Magnus and Benjamin, who worked in a far away country whose currency, instead of the dollar (\$), was the **aero** (£).
- Benjamin's annual salary was 40 more aers than one tenth of Magnus' salary.
  - Magnus was paying 20% of his income in taxes, whereas Benjamin's tax rate was only 10% and their combined tax bill was 130 aers.

What were each of the two brothers' annual salaries?

(a) Introduce variables and say what they mean.

(b) Write two equation reflecting the listed statements.

(c) Solve the equations in (b) to answer the question.

4. Simplify the following expressions and leave your answers without negative exponents:

$$\frac{-25y^2x^{-7}}{5y^{-3}x^{10}} =$$

$$\left(\frac{-2x^5}{3x^2y^{-5}}\right)^{-2} =$$

5. Multiply the following binomials

$$(3x^2 - 5x)(2x^5 + 7x^3) =$$

Use you **rules for binomial multiplication** (sum squared, difference squared, sum times difference) to multiply

$$[(x - 7z) + 5][(x - 7z) - 5] =$$