Not a real exam Version Name: _____

Instructions: This is just a test of the emergency exam broadcast system. If it were a real exam, this note would be followed by instructions on how to complete the exam and indications about what kinds of resources are available during said exam.

1. (2 pts) Solve the inequality $\frac{3.0}{x+1} \geq \frac{7.0}{x-1}$:

   $3.0x + 3.0 \geq 7.0x - 7.0$ $(-\infty, -2.5] \cup (-1, 1)$

2. (2 pts) Solve the inequality $\frac{1.0}{x-4} \geq \frac{5.0}{x+4}$:

   $1.0x - 4.0 \geq 5.0x + 20.0$ $(-\infty, -4) \cup (4, 6.0]$

3. (4 pts) Solve the polynomial equation: $x^2 - x - 12 = 0$.

   $$\begin{aligned} x^2 - x - 12 &= (x+3)(x-4) \\ &\Rightarrow x \in \{-3, 4\} \end{aligned}$$

4. (4 pts) Solve the polynomial equation: $5x^2 - 4x + 13 = 0$.

   $5x^2 - 4x = -13$

   $x^2 - \frac{4x}{5} = -\frac{13}{5}$

   $x^2 - \frac{4x}{5} + \frac{4}{25} = -\frac{61}{25}$

   $\left(x - \frac{2}{5}\right)^2 = -\frac{61}{25}$

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   $x - \frac{2}{5} = \pm\frac{\sqrt{61}i}{5}$

   $x \in \left\{\frac{2}{5} - \frac{\sqrt{61}i}{5}, \frac{2}{5} + \frac{\sqrt{61}i}{5}\right\}$