Handout 4: Not All Equations Are Created Equal-

1. Solve
$$\frac{3}{r+1} + \frac{4}{r-1} = 2$$
.

$$x = \frac{7 + \sqrt{73}}{4}$$
 and $x = \frac{7 - \sqrt{73}}{4}$

2. Solve
$$-x^4 + 4x^2 - 3 = 0$$
.

$$x = \pm 1$$
 and $x = \pm \sqrt{3}$.

3. Solve
$$x + \frac{1}{2x+1} = 1$$
.

$$x = 0 \text{ and } x = \frac{1}{2}.$$

4. Solve
$$x - 2\sqrt{x} + 1 = 0$$
.

$$x = 1$$
.

5. Solve the inequality
$$-2x^2 + 3x + 1 < 0$$
. 10. Solve the inequality $-x^2 - 2x + 1 > 0$.

$$-\infty < x < \frac{1-\sqrt{17}}{4}$$
 and $\frac{-3-\sqrt{17}}{4} < x < \qquad \qquad -1-\sqrt{2} < x < -1+\sqrt{2}$ $\infty.$

6. Solve the inequality
$$x^2 - 3 \ge x$$
.

$$-\infty < x \le \frac{1-\sqrt{13}}{2}$$
 and $\frac{1+\sqrt{13}}{2}x < \infty$.

7. Solve the inequality
$$-x^2 + 4x > 3$$
.

$$1 < x < 3$$
.

8. Solve the inequality
$$2x^2 + 7x - 2 \le 2$$
.

$$-4 \le x \le \frac{1}{2}$$

9. Solve the inequality
$$6x < 3x^2 - 9$$
.

$$-\infty < x < -1$$
 and $3 < x < \infty$

10. Solve the inequality
$$-x^2 - 2x + 1 > 0$$
.

$$-1 - \sqrt{2} < x < -1 + \sqrt{2}$$

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