Find all real number solutions of each of the following equations. If the solutions are irrational, then express them rounded to three significant digits. Show your work neatly organized.

1. $3x(7x + 4) = x + 2$

2. $x^2 + (x + 7)^2 = (2x + 3)^2$

3. $3x^2 = x + 1$

4. $x(5x + 8) - 3(2x + 1) = x - 3$

5. $|3x - 5| = 1$

6. $|5x + 2| = 2$

7. $|4x - 3| = 0$

8. $|x - 5| = -5$

Find all real number solutions of each of the following equations. If the solutions are irrational, then express them rounded to three significant digits. Show your work neatly organized.

9. $|x^2 + 3x| = 2$

10. $|3x^2 - 5x| = 2$

Solve each of the following inequalities. Represent the solution set as an interval or the union of intervals.

11. $|2x + 7| < 5$

12. $|3x - 1| \leq 4$

13. $|4x - 3| \geq 2$

14. $|7 - 5x| > 2$

Solve each of the following inequalities. Represent the solution set as an interval or the union of intervals.

15. $|2x - 5| < -3$

16. $|6x + 1| \geq 0$

Solve each of the following quadratic inequalities. Represent the solution set as an interval or as the union of intervals. (Express irrational numbers rounded to two significant digits.)

17. $3x^2 \leq 7x + 6$

18. $x^2 + 3x > 1$

19. $x(x + 2) - 3(x - 1) < (2x + 1)^2$

20. $5(4x - 7) \geq 3x(x - 2)$