Homework: Linear Equations and Rational Equations

In Problems 1-7, solve each linear equation

1. $6x - 3 = 27$	2. $8x - (3x + 2) = 38$
3. $8x - 2 = 10 + 2x$	4. $5x - 3 = 9x + 7$
5. $5(x - 3) + 2 = 4(x - 6)$	6. $2(x - 1) - 3(x + 4) = x - 7 - (x + 4)$
7. $9 = 5(x - 4) - (x + 6)$	

In Problems 8-14, solve each linear equation

8. $\dfrac{x}{5} = \dfrac{x}{3} + 2$	9. $-4 + \dfrac{x}{3} = \dfrac{x}{5}$
10. $\dfrac{3x}{4} = \dfrac{7x}{3} - 2$	11. $\dfrac{7x}{2} - 3x = \dfrac{x}{4} - \dfrac{1}{3}$
12. $\dfrac{x - 7}{4} = \dfrac{1}{10} + \dfrac{x + 3}{20}$	13. $\dfrac{x}{7} = -3 + \dfrac{x - 7}{2}$
14. $\dfrac{x + 4}{6} = 2 - \dfrac{x + 5}{5}$	

In Problems 15-19, solve each rational equation

15. $\dfrac{2}{x} = \dfrac{7}{3x} + 1$	16. $\dfrac{1}{5x} + \dfrac{1}{2} = \dfrac{4}{3x} - \dfrac{1}{3}$
17. $\dfrac{5}{x + 3} + 4 = \dfrac{25}{x + 3}$	18. $\dfrac{1}{5x - 10} + \dfrac{1}{5} = \dfrac{7}{x - 2}$
19. $\dfrac{3}{x + 2} - \dfrac{5}{x - 2} = \dfrac{4x}{x^2 - 4}$	

In Problems 20-23, Determine whether each equation is an identity, a conditional equation, or an inconsistent equation

20. $2(x + 1) = 2x + 2$	21. $7x - 1 = 7x + 1$

| 22. $7x - 3x = 9x$ | 23. $\dfrac{9x}{x+1} = \dfrac{-9}{x+1} + 2$ |

In Problems 25-28, factor using the formula for the sum or difference of two cubes

25. $x^3 + 8$	26. $x^3 - 125$
27. $27x^3 - 8$	28. $8x^3 + 27y^3$

In Problems 29-31, factor completely

29. $5x^3 - 20x$	30. $5x^2 - 15x - 20$
31. $x^3 + 7x^2 - 4x - 28$	