

Appendix Review Problems

Simplify each expression.

1. $(x^3 - 3x^2) - (6 - 2x - 4x^2)$

2. $\frac{3}{4}(2x - 5y) + \frac{1}{2}\left(\frac{2}{3}x + 4y\right)$

3. $(x^2 - 6xy - 2y^2) + (7x^2 - xy + 8y^2) - (-x^2 + 5xy - y^2)$

4. $x^{-3}y^2(yx^4 + y^{-1}x^3 + y^{-2}x^2)$

5. $(4 - 3x)^2$

6. $(x^2 - 5)(2x^2 + 3)$

7. $(x - 2)(x + 2)(x^2 + 5)$

8. $(3x - 5)^3$

9. $\frac{5x-5}{x^2-1}$

10. $\frac{x^2-x-6}{x^2+6x+9} \cdot \frac{x+3}{x^2-4}$

11. $(x^2 - 9) \div \left(\frac{x+3}{5}\right)$

12. $6 - \frac{5}{x+3}$

13. $\frac{1}{x^2 - x - 2} - \frac{x}{x^2 - 5x + 6}$

14. $\frac{\frac{2x}{x^2-4}}{\frac{3}{x^2-4x+4}}$

15. $\frac{x^4-81}{xy+4y+3x+12} \cdot \frac{1}{x^2+9}$

Completely factor the expression.

16. $10x^3y - 12x^2y^2$

17. $3x^2 - 27$

18. $10x^2 - 14xy - 15x + 21y$

19. $x^3 + 8000$

20. $6x^2 + 27x - 15$

21. $6x^3 - 61x^2 + 10x$

22. $7mx^2 + 2nx^2 - 7my^2 - 2ny^2$

Solve the following equations and inequalities. Write the solution to the inequalities in interval notation.

23. $\frac{1}{3}x + 2 = 5 - \frac{1}{6}x$

24. $3x - 8 \geq \frac{1}{2}(10x + 7)$

25. $9x - 10 = 5x + 2(2x - 5)$

26. $\frac{1}{x-2} + \frac{3}{x+3} = \frac{4}{x^2 + x - 6}$

27. $0 \leq \frac{x+3}{2} < 5$

28. $|2x+9| = 13$

29. $-2|x+10| + 12 \leq 4$

30. $|4 - 3x| + 7 < 12$

31. $x + \sqrt{31 - 9x} = 5$

32. $\sqrt{4x^2 - 3x + 2} - 2x - 5 = 0$

31. Solve by factoring.

$$2x^2 = 19x + 33$$

32. Solve by taking square roots.

$$-3x^2 + 17 = 32$$

33. Solve by completing the square.

$$2x^2 - 8x + 5 = 0$$

34. Solve using the quadratic formula.

$$6x^2 - 2x + 1 = 0$$

35. $\frac{1}{x+4} = \frac{2}{x^2+3x-4} - \frac{1}{1-x}$

36. $\frac{3}{x^2+5x+6} + \frac{x-1}{x+2} = \frac{7}{x+3}$