

Algebra 1
Semester 2 Review

1. Add: $(2x^2 + 7x - 3) + (5x^2 - 9x - 10)$
2. Subtract: $(3x^2 - 3x - 1) - (8x^2 - 5x + 4)$
3. Add: $(7x^3 + 7x + 6) + (4x^2 - 5x^2 - 10)$
4. Multiply: $4x(6x^2 + 5x - 2)$
5. Multiply: $(7x + 5)(3x - 2)$
6. Multiply: $(3x + 1)(x^2 + 4x + 2)$
7. Multiply: $(x + 5)^2$
8. Multiply: $(7x - 4)^2$
9. Factor Completely: $8x^2 + 24x + 12$
10. Factor: $12x^2 + 42$
11. Factor: $x^2 + 5x - 36$
12. Factor: $2x^2 + 11x + 15$
13. Factor the following: $49x^2 - 25$
14. Factor Completely: $5x^2 - 45$
15. Factor: $3x^3 - 24x^2 - 60$
16. Simplify each: a) $\sqrt{75}$ b) $\sqrt{50x^4}$ c) $\sqrt{18x^6}$
17. Simplify each:
 - a) $7\sqrt{5} - 11\sqrt{5} + \sqrt{5}$
 - b) $3\sqrt{10} - \sqrt{10} + 9\sqrt{10}$
 - c) $3\sqrt{18} - \sqrt{8}$
 - d) $7\sqrt{20} + \sqrt{45}$
18. Simplify each: a) $-3\sqrt{10x^2} \cdot \sqrt{2x}$
b) $4\sqrt{2x} \cdot \sqrt{6x^2}$
19. Solve: $5x^2 = 45$
20. Solve: $(x + 10)^2 = 36$
21. Use the zero product property to solve:
 $(3x + 10)(x - 4) = 0$
22. What are the solutions for the quadratic equation
 $x^2 + 4x = 21$?
23. Solve: $x^2 - 7x - 18 = 0$
24. Solve: $16x^2 - 81 = 0$
25. Find the roots: $x^2 - 15x + 36 = 0$

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26. Use the Quadratic Formula to solve the equation:
 $x^2 - 7x + 1 = 0$

27. Solve: $3x^2 + 8x + 2 = 0$

28. Solve: $x^2 + 2x + 5 = 0$

29. Solve by completing the square:
 $x^2 + 6x - 5 = 0$

30. Solve by completing the square:
 $x^2 + 8x - 3 = 0$

31. Graph:

a) $y = x^2 - 5$ b) $y = -x^2 + 4$

a) $y = -x^2 - 2$ b) $y = x^2 + 3$

32. Determine the vertex for the following graphs:

a) $y = x^2 + 8x - 3$ b) $y = -2x^2 + 12x - 10$

33. Determine the x-intercept(s) for the graph of
 $y = x^2 + 10x + 24$

34. Find the zeros of: $y = x^2 - 7x - 18$

35. Determine the x-intercept(s) for the graph of
 $y = x^2 - 5x - 14$

36. Determine the y-intercept for the graph of

a) $y = 5x^2 - x + 9$ b) $y = 4x^2 + 6x - 3$

37. Simplify: $\frac{12(x-5)}{21(x-5)^7}$

38. What is $\frac{x^2 + 5x - 14}{x^2 + 3x - 10}$ reduced to lowest terms?

39. Simplify: $\frac{8x - 16}{x^2 - 4}$

40. Perform the indicated operation and simplify.

$$\frac{x}{x-2} \cdot \frac{x^2 - 2x}{x^2 + 5x}$$

41. $\frac{x^2 + 12x + 36}{x-2} \div \frac{5x + 30}{x^2 - 4}$

42. Add
 $\frac{4x}{x^2 + 7x + 6} + \frac{10x}{x^2 + 7x + 6}$

43. Solve $2 + \frac{5}{x} = \frac{9}{x} + 1$

44. Solve $\sqrt{x+2} = 8$

45. Solve the following equation for x:
 $\sqrt{3x-1} + 5 = 8$