Algebra 2 Semester 1 Final Review

SHOW ALL WORK on a separate piece of paper. This is due ON OR BEFORE the day of the final and is worth up to 3% extra credit on your Final Exam grade.

Solve the equation.

1. $4x^3 - 8x^2 - x + 2 = 0$
2. $3x^4 - 11x^2 - 20 = 0$
3. $2x^2 + 1 = -15$

Solve the equation for *y*.

4. $2xy + x = 12$
5. $\frac{2x+y}{3} = 5$

Graph the quadratic function.

6. $y = -\frac{1}{3}(x + 1)(x - 5)$
7. $y = -2x^2 + 8x - 5$
8. $y = (x + 3)^2 + 1$
9. Graph $y \leq -x^2 + 4x + 2$
10. Write $y = 4(x - 3)^2 - 7$ in standard form.
11. Write $y = x^2 - 10x + 16$ in intercept form and give the function's zeros.
12. Write $y = x^2 + 18x - 4$ in vertex form and identify the vertex.
13. Write an equation of a quadratic function with points on graph: (1, 7), (4, –2), (5, –1)
14. Solve $9x^2 + 6x + 1 = 0$ by factoring
15. Solve $4x^2 + 28x - 15 = 0$ by factoring
16. Solve $x^2 + 12x = 13$ by completing the square

Solve the quadratic equation using any method.

17. $3(p - 9)^2 = 81$
18. $7x^2 - 3 = 11$
19. $x^2 + 4 = -32$
20. $m^2 + 8m = -3$

Write the expression as a complex number in standard form.

21. $(8 + i)(6 + 2i)$
22. $(-4 + 2i) - (7 - 3i)$

Describe the end behavior of the graph of the polynomial function and graph the function.

23. $y = x^4 - 2x^2 - x - 1$
24. $y = -3x^3 - 6x^2$

Perform the indicated operation.

25. $(3x^2 - 5x + 7) - (2x^2 + 9x - 1)$
26. $(12x^3 + 31x^2 - 17x - 6) \div (x + 3)$
27. $(2x - 3)(5x^2 - x + 6)$
28. $(8x^4 + 5x^3 + 4x^2 - x + 7) \div (x + 1)$
29. Graph the relation. Then tell whether the relation is a function.

x	2	–3	4	0	–3	1
y	2	–2	0	2	3	–1

30. Given $f(x) = 80 - 3x$; find $f(5)$

Factor the polynomial completely.

31. $n^5 + 216n^2$

32. $5x^4 + 10x^2 - 15$

33. $2x^3 - 3x^2 + 4x - 6$

34. $64x^3 + 343$

35. Simplify the radical expressions $\sqrt{500}$ and $\sqrt{\frac{8}{3}}$.

Evaluate:

36. $8^{4/3}$.

37. $16^{-5/4}$

Simplify:

38. $\frac{\sqrt[5]{9} \cdot \sqrt[5]{81}}{\sqrt[5]{3}}$

39. $\sqrt[4]{512} + 3\sqrt[4]{2}$

40. $\frac{15x^2y}{6x^4y^5} \cdot \frac{6x^3y^2}{5xy}$

41. $\left(8x^3y^2\right)^{-3}$

42. $\sqrt{\frac{16xy^2}{27z^5}}$

43. $\sqrt[3]{6x^3y^7} \cdot \sqrt[3]{4x^5}$

44. $(x^{-2/5}y^{1/3})^{15}$

45. $5\sqrt[3]{64x^7} - x\sqrt[3]{8x^4}$

46. $\left[2^{1/3}(3^{1/3})\right]^3$

Find the discriminant of the equation and give the number and type of solutions of the equation.

47. $4x^2 + 2x - 5 = 0$

48. $x^2 + 7 = 3x$

Write the expression as a complex number in standard form.

49. $\frac{2+i}{2-i}$

Factor the polynomial completely.

50. $16x^2 - 4y^2$

51. $54y^3 + 2$

Let $f(x) = 3x$ and $g(x) = x - 5$. Perform the indicated operation and state the domain.

52. $f(x) + g(x)$

53. $f(x) - g(x)$

54. $f(x) \cdot g(x)$

55. $\frac{f(x)}{g(x)}$

Solve the equation. Check for extraneous solutions.

56. $x^{1/2} + 3 = 4$

57. $3\sqrt{2x+4} = 12$