

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 for y .

1. $2xy + x = 12$

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

Graph each function

3. $y = -\frac{1}{3}(x+1)(x-5)$

4. $y = -2x^2 + 8x - 5$

5. $y = (x+3)^2 + 1$

6. $y = 2\sqrt{x+3} - 4$

7. $y = -2\sqrt[3]{x+1} + 5$

8. $y = -|x+5| + 7$

9. $y = 3(x+2)^3 - 4$

10. Graph $y \leq -x^2 + 4x + 2$

Solve the quadratic equation using any method.

11. $3(p-9)^2 = 81$

12. $7x^2 - 3 = 11$

13. $x^2 + 4 = -32$

14. $m^2 + 8m = -3$

15. $2x^2 + 1 = -15$

Write the expression as a complex number in standard form.

16. $(8+i)(6+2i)$

17. $(-4+2i) - (7-3i)$

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

Perform the indicated operation.

19. $(3x^2 - 5x + 7) - (2x^2 + 9x - 1)$

20. $(12x^3 + 31x^2 - 17x - 6) \div (x+3)$

21. $(2x-3)(5x^2 - x + 6)$

22. $(8x^4 + 5x^3 + 4x^2 - x + 7) \div (x+1)$

23. 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

Evaluate:

24. $8^{4/3}$

25. $16^{-5/4}$

Simplify:

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

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

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

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

30. $5\sqrt[3]{64x^7} - x\sqrt[3]{8x^4}$

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

Factor the polynomial completely.

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

33. $5x^4 + 10x^2 - 15$

34. $2x^3 - 3x^2 + 4x - 6$

35. $64x^3 + 343$

36. $16x^2 - 4y^2$

37. $54y^3 + 2$

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

38. $y = x^4 - 2x^2 - x - 1$

39. $y = -3x^3 - 6x^2$

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

40. $4x^2 + 2x - 5 = 0$

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

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

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

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

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

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

Solve the equation. Check for extraneous solutions.

46. $3\sqrt{2x+4} = 12$

47. $3 = |-6 + 3b|$

48. $|2x + 3| = 3x$

49. $|5x - 6| = x$

50. $|x + 1| = 4x$

51. $\sqrt[3]{x-5} = -3$

52. $3x^{3/4} = 192$

Solve the absolute value inequality.

53. $|3x + 4| > 5$

54. $|2x - 4| - 1 > 0$

55. $|x + 8| \geq 10$

Find all zeros of the polynomial function.

56. $f(x) = x^3 - 24x - 32$

57. $f(x) = x^3 - 4x^2 - 11x + 2$

58. $f(x) = x^4 - 2x^3 - 23x^2 - 2x - 24$

59. $4x^3 - 8x^2 - x + 2 = 0$

60. $3x^4 - 11x^2 - 20 = 0$

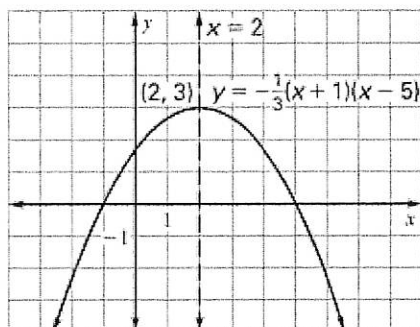
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Answer Section

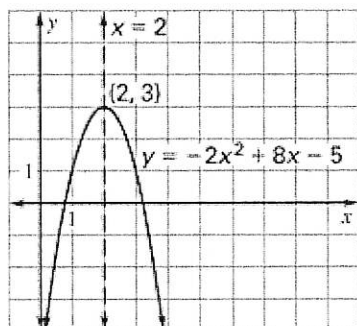
1. $y = \frac{12-x}{2x}$

2. $15-2x$

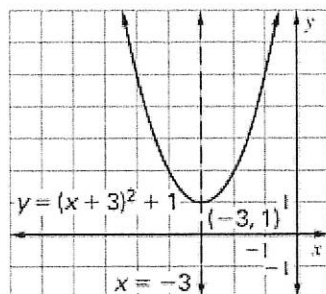
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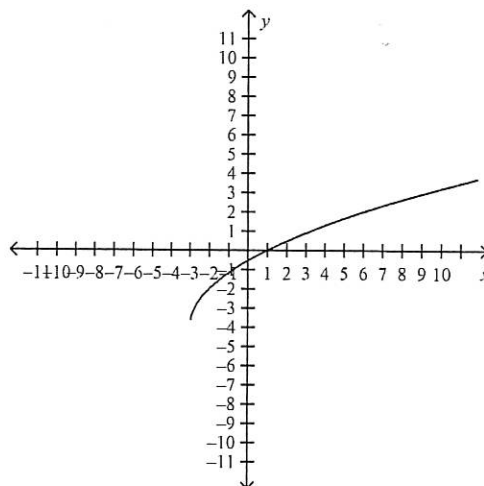
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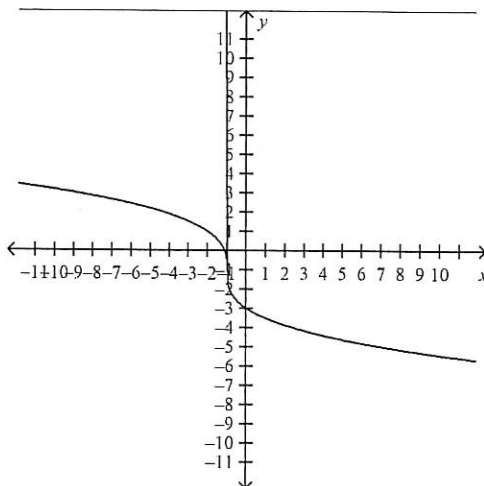
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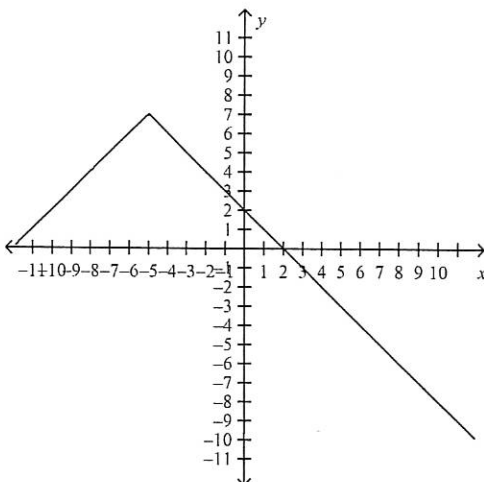
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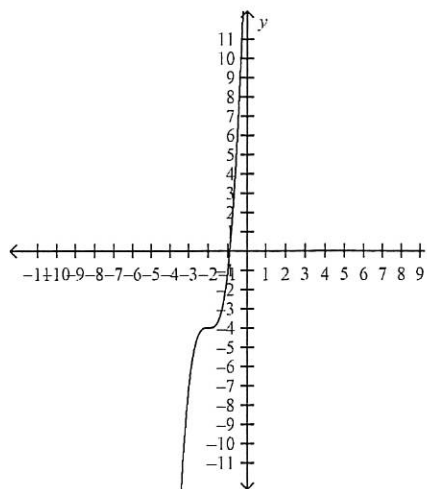
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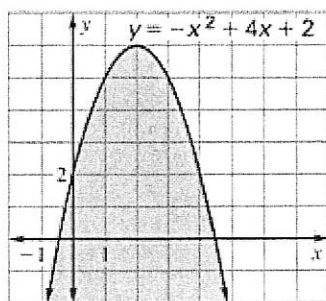
8.



9.



10.



11. $p = 9 \pm 3\sqrt{3}$

12. $x = \pm\sqrt{2}$

13. $\pm 6i$

14. $m = -4 \pm \sqrt{13}$

15. $2i\sqrt{2}, -2i\sqrt{2}$

16. $46 + 22i$

17. $-11 + 5i$

18. $\frac{3+4i}{5}$

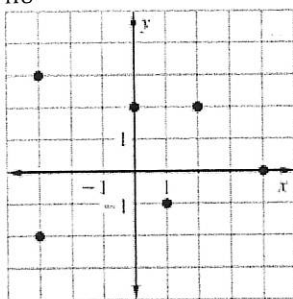
19. $x^2 - 14x + 8$

20. $12x^2 - 5x - 2$

21. $10x^3 - 17x^2 + 15x - 18$

22. $8x^3 - 3x^2 + 7x - 8 + \frac{15}{x+1}$

23. no



24. 16

25. $\frac{1}{32}$

26. $7^4\sqrt{2}$

27. $\frac{4y\sqrt{3xz}}{9z^3}$

28. $2x^2y^2\sqrt[3]{3x^2y}$

29. $\frac{1}{x^{10}} \cdot y^5$

30. $18x^2\sqrt[3]{x}$

31. 65

32. $n^2(n+6)(n^2-6n+36)$

33. $5(x^2+3)(x-1)(x+1)$

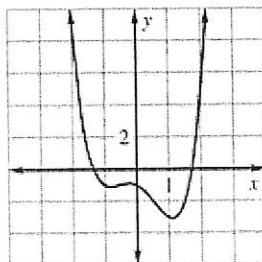
34. $(2x-3)(x^2+2)$

35. $(4x+7)(16x^2-28x+49)$

36. $4(2x+y)(2x-y)$

37. $2(3y+1)(9y^2-3y+1)$

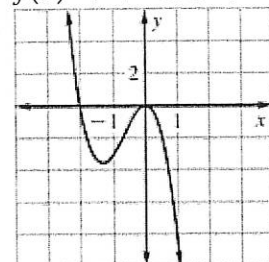
38.



$f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$,

$f(x) \rightarrow +\infty$ as $x \rightarrow \infty$

39. $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$, $f(x) \rightarrow -\infty$



as $x \rightarrow +\infty$

40. 84; two real solutions

41. -19; two imaginary solutions

42. $4x - 5$;

Domain: all real numbers

43. $2x + 5$;

Domain: all real numbers

44. $3x^2 - 15x$;

Domain: all real numbers

45. $\frac{3x}{x-5}$;

Domain: all real numbers except 5

46. 6

47. 3, 1

48. $x = 3$

49. $1, \frac{3}{2}$

50. $\frac{1}{3}$

51. -22

52. $x = 256$

53. $x > \frac{1}{3}$ or $x < -3$

54. $x > \frac{5}{2}$ or $x < \frac{3}{2}$

55. $x \geq 2$ or $x \leq -18$

56. $-4, 2 \pm 2\sqrt{3}$

57. $-2, 3 \pm \sqrt{2}$

58. -4, 6, $\pm i$

59. $x = 2, \frac{1}{2}, -\frac{1}{2}$

60. $x = \pm\sqrt{5}, \pm \frac{2i\sqrt{3}}{3}$