

Algebra 2 Honors Final Exam Review
Do Not Limit Your Studying to this Review!

Simplify:

1. $\left(\frac{b^6}{c^9}\right)^5$

2. $(-2s^3t^4u)^2$

3. $\frac{6x^2}{y^3} \cdot \frac{y^{-2}x^3}{9x^2}$

4. $\frac{4x^3}{y^2} \cdot \frac{y^{-3}x^{-2}}{8x^{-1}}$

5. Evaluate the polynomial when $d = 5$: $7d^3 - 6d^2 - 5d - 12$

6. Evaluate the polynomial when $w = 3$: $3w^3 + 5w^2 + 2w + 5$

7. Graph: $f(x) = 9x - x^3$

8. Graph: $y = -x^4 + x^2 - 3$

9. Add: $(6f^5 + 8f^3 - 8) + (5f^5 - 3f + 8)$

10. Subtract: $(-8x^3 + 5x) - (-2x + 6 - 6x^3)$

11. Multiply: $(x - 3)(x^2 + 2x + 4)$

12. Factor completely: $8x^4 - 28x^6$

Factor:

13. $x^8 - 9$

14. $2x^7 + 10x^5 - 28x^3$

15. Factor completely with respect to the integers. $4x^3 - 8x^2 + 3x - 6$

16. Factor completely with respect to the integers. $2x^4 - 14x^2 + 24$

17. Factor completely with respect to the integers. $x^4 - 13x^2 + 36$

18. Find all real-number solutions.
 $x^3 - 5x^2 + 8x - 4 = 0$

19. Find all real-number solutions.
 $x^3 - 9x^2 + 27x - 27 = 0$

20. Divide using synthetic division:
 $(2x^4 - 6x^3 - 24x - 28) \div (x - 4)$

21. Use long division:
 $(4x^4 + 2x^3) \div (2x^2 - 3)$

22. Simplify: $\left(\frac{1}{64}\right)^{1/3}$

23. Evaluate. $16^{5/4}$

24. Evaluate. $(27)^{2/3}$

25. The volume of a sphere can be given by the formula $V = 4.18879r^3$. You have to design a spherical container that will hold a volume of 75 cubic inches. What should the radius of your container be?
26. A large city is growing by a rate of 0.5% annually. If there were 3,260,000 residents of the city in 1997, predict how many (to the nearest thousand) will be living in the city in 2002. Use $y = 3,260,000(2.7)^{0.005t}$, where $t = 0$ represents 1997.
27. Find an equation for the inverse of the relation $y = 5x + 3$.

Graph:

28. $f(x) = \sqrt{x} + 5$

29. $f(x) = \sqrt[3]{x-3} - 5$

30. Refer to the function $g(x) = 1 + \sqrt{x+3}$. Sketch the graph of $g(x)$.

Solve the equation. Check for extraneous solutions.

31. $\sqrt{x+2} = x$

33. $(3x-8)^{1/2} = 5$

32. $\sqrt[3]{x-5} = -4$

34. Find the mean of the set of numbers, to the nearest hundredth.
24, 11, 40, 29, 21, 11, 33, 11

35. Mike was in charge of collecting contributions for the Food Bank. He received contributions of \$70, \$100, \$30, \$70, \$60. The next potential contributor wanted to give an amount in line with the other contributions so he asked, "What is an acceptable amount to give?"

Find the following:

- mean (average)
- median
- mode
- range

36. Find the value of \$1000 deposited for 8 years in an account paying 8% annual interest compounded semiannually.
37. Find the value of \$1000 deposited for 10 years in an account paying 6% annual interest compounded monthly.

Simplify the expression.

38. $e^x \cdot 6e^{3x-1}$

39. $\sqrt[3]{125e^{12x}}$

40. Use the formula $A = Pe^{rt}$. If \$3900 is deposited in an account at the bank and earns 9% annual interest, compounded continuously, what is the amount in the account, rounded to the nearest dollar, after 7 years?

41. Evaluate without using a calculator. $\log_2 16$

42. Evaluate without using a calculator. $\log_7 \frac{1}{49}$

43. Evaluate the expression. $\log_{1/5} 125$

44. Expand using the properties of logarithms: $\log_4 \frac{x(x+3)}{x^5}$

45. Expand the expression. $\log_3(x^{-2}y^3)$

46. Expand the expression. $\log_5 \left(5 \sqrt{\frac{x}{y}} \right)$

47. Solve for x . $2 \log_5 10 - \frac{1}{4} \log_5 x = \log_5 50$

48. Solve for x . $\log_{10} 8 - \frac{1}{3} \log_{10} x = \log_{10} 2$

49. Graph $y = -\frac{4}{x+2}$.

50. Sketch the graph of the function. $f(x) = \frac{x-2}{x+2}$

51. Identify all horizontal and vertical asymptotes of the graph of the function. $f(x) = \frac{x^2}{x^2-4}$

52. Sketch the graph of the function. $f(x) = \frac{x^2}{x^2-9}$

53. Simplify the rational expression. $\frac{n^2+8n+15}{n^2-25}$

54. Divide: $\frac{x^2 + 9x + 18}{x^2 - 9} \div \frac{x + 6}{x - 6}$

55. Simplify the expression. $\frac{x^3 + 4x^2}{x^2 - 16}$

56. Multiply and simplify. $\frac{(x+2)^2}{x-5} \cdot \frac{x^2 - 2x}{x^2 - 4}$

57. Simplify: $\frac{2x+4}{-24x} + \frac{2x-4}{-24x}$

58. Perform the operations and simplify. $\frac{3x+4}{x^2-16} - \frac{2}{x-4}$

59. Simplify: $\frac{\frac{x^2 - 2x + 1}{15x}}{\frac{x-1}{5x}}$

60. Simplify the complex fraction. $\frac{\frac{4}{x-3} + \frac{2}{3}}{\frac{5}{x-3}}$

Solve:

61. $\frac{x^2}{x+7} = \frac{49}{x+7}$

62. $\frac{x}{3} - \frac{x}{10} = 7$

63. Is $x = -3$ a solution of $\frac{x+4}{x+3} = 2 + \frac{1}{x+3}$?

64. Solve the equation. $\frac{2x}{x-2} = \frac{1}{x^2-4} + 1$

65. Write the standard form of the equation of the circle with radius 7 and center at (0, 0).

66. Write the standard form of the equation of the circle that passes through the point (0, 1) with its center at the origin.

67. Write an equation of the ellipse with a vertex at (9, 0), a co-vertex at (0, 5), and center at (0, 0).

Graph:

68. $36x^2 + 9y^2 = 324$

69. $\frac{x^2}{16} - \frac{y^2}{25} = 1$

70. Graph the equation and identify the

asymptotes: $\frac{x^2}{25} - \frac{y^2}{4} = 1$

Answers:

[1] $\frac{b^{30}}{c^{45}}$

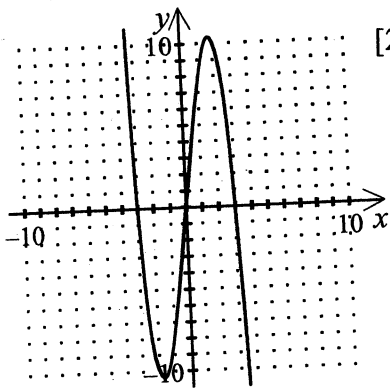
[2] $4s^6t^8u^2$

[3] $\frac{2x^3}{3y^5}$

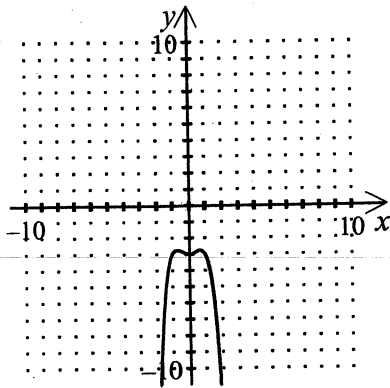
[4] $\frac{x^2}{2y^5}$

[5] 688

[6] 137



[7]



[8]

[9] $11f^5 + 8f^3 - 3f$

[10] $-2x^3 + 7x - 6$

[11] $x^3 - x^2 - 2x - 12$

[12] $4x^4(2 - 7x^2)$

[13] $(x^4 + 3)(x^4 - 3)$

[14] $2x^3(x^2 + 7)(x^2 - 2)$

[15] $(x-2)(4x^2 + 3)$

[16] $2(x-2)(x+2)(x^2 - 3)$

[17] $(x-2)(x+2)(x-3)(x+3)$

[18] 1; 2

[19] 3

[20] $2x^3 + 2x^2 + 8x + 8 + \frac{4}{x-4}$

[21] $2x^2 + x + 3 + \frac{3x+9}{2x^2-3}$

[22] $\frac{1}{4}$

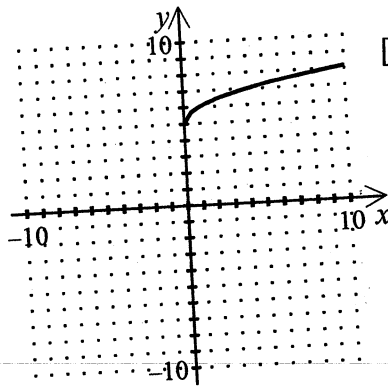
[23] 32

[24] 9

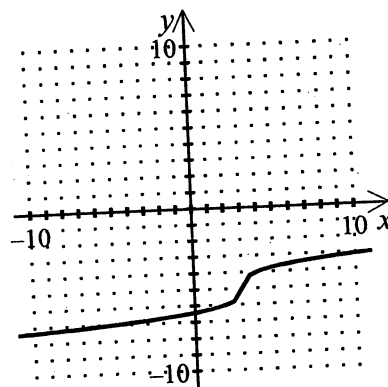
[25] 2.62 in.

[26] 3,342,000

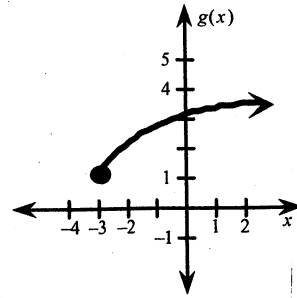
[27] $y = \frac{x-3}{5}$



[28]



[29]



[30]

[31] 2

[32] -59

[33] x = 11

[34] 22.50

mean = \$66

median = \$70

mode = \$70

[35] range = \$70

[36] \$1872.98

[37] \$1819.40

[38] $6e^{4x-1}$

[39] $5e^{4x}$

[40] \$7323

[41] 4

[42] -2

[43] -3

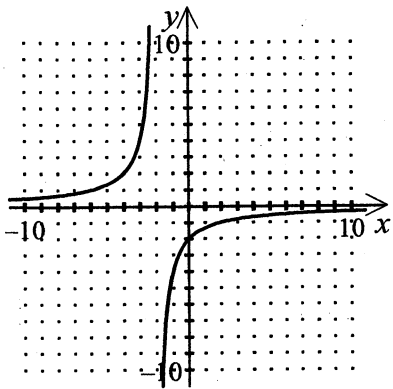
[44] $\log_4 x + \log_4(x+3) - 5\log_4 x$

[45] $-2\log_3 x + 3\log_3 y$

[46] $1 + \frac{1}{2}\log_5 x - \frac{1}{2}\log_5 y$

[47] x = 16

[48] x = 64



[49]

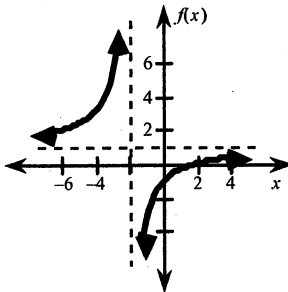
[61] $\{7\}$

[62] 30

[63] It is not.

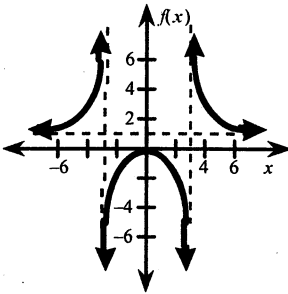
[64] $x = -1, x = -3$

[65] $x^2 + y^2 = 49$



[50]

[51] $x = 2, x = -2, y = 1$



[52]

[53] $\frac{n+3}{n-5}$

[54] $\frac{x-6}{x-3}$

[55] $\frac{x^2}{x-4}$

[56] $\frac{x(x+2)}{x-5}$

[57] $-\frac{1}{6}$

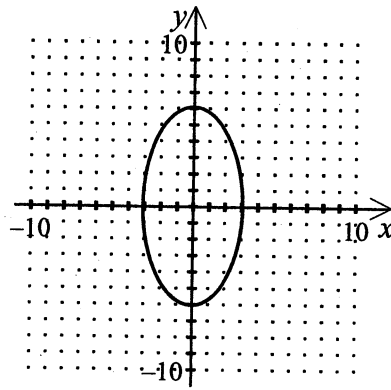
[58] $\frac{1}{x+4}$

[59] $\frac{x-1}{3}$

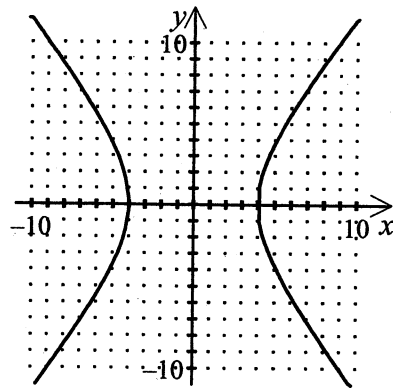
[60] $\frac{2(x+3)}{15}$

[66] $x^2 + y^2 = 1$

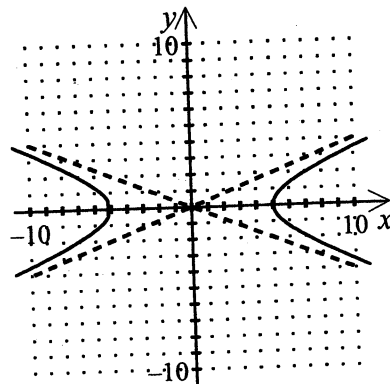
[67] $\frac{x^2}{81} + \frac{y^2}{25} = 1$



[68]



[69]



[70]