

Algebra 2 - Final Exam Review

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Solve each equation. Remember to check for extraneous solutions.

1) $\frac{5}{3a^2} = \frac{1}{6a^2} + \frac{1}{6a}$

2) $\frac{1}{3r} + \frac{r+1}{3r} = \frac{1}{r}$

3) $\frac{5}{x^2 - 3x} = \frac{1}{x^2 - 3x} + \frac{5}{x}$

4) $\frac{2}{v} + \frac{1}{v^2 + 4v} = \frac{4}{v^2 + 4v}$

5) $\frac{1}{x^2} + \frac{x+1}{2x} = \frac{x^2 - 3x - 10}{2x^2}$

6) $2 = \frac{1}{n} + \frac{6}{n^2}$

7) $\sqrt{3x+12} = \sqrt{-3-2x}$

8) $\sqrt{2x+2} = \sqrt{18-2x}$

9) $\sqrt{-5-6m} = 7$

10) $\sqrt{23n+3} = 7$

11) $x = \sqrt{-1-2x}$

12) $\sqrt{110-n} = n$

13) The average profit of a company (in millions per month) from 2001 to 2008 can be modeled by the equation $y = 4.5\sqrt{1.2x + 1.05}$ where x is the number of years since 2000. In what year will the profit be 12 million?

14) Huong can clean an attic in 16 hours. Carlos can clean the same attic in 9 hours. How long would it take them if they worked together?

15) Working alone, it takes Gabriella 12 hours to mop a warehouse. DeShawn can mop the same warehouse in 11 hours. How long would it take them if they worked together?

Simplify. Your answer should contain only positive exponents.

16) $4u^4 \cdot 2uv^2 \cdot 3uv^2$

17) $4u^{-4}v^0 \cdot 4u^{-1}$

18) $(2y^{-3})^2$

19) $(2a^{-2})^{-4}$

Condense each expression to a single logarithm.

20) $2\log_6 u + 12\log_6 v$

21) $18\log x + 6\log y$

22) $\log_3 u + \log_3 v + 4\log_3 w$

23) $2\log u + 4\log v$

24) $4\log_8 x - 8\log_8 y$

Expand each logarithm.

25) $\log_9 \left(\frac{x}{y^2} \right)^6$

26) $\log_7 (uv^3)^2$

27) $\log_6 \frac{x^2}{y^5}$

28) $\log_5 \left(\frac{u}{v^3} \right)^6$

Use a calculator to approximate each to the nearest thousandth.

29) $\log_3 \frac{1}{27}$

30) $\log_7 49$

31) $\log_2 70$

32) $\log_4 7$

Rewrite each equation in exponential form.

33) $\log_x 197 = y$

34) $\log_2 x = y$

35) $\log_{14} a = 2$

36) $\log_{16} u = v$

Rewrite each equation in logarithmic form.

37) $x^{-3} = y$

38) $m^{-5} = 100$

39) $a^b = 147$

40) $x^y = 120$

Solve each equation. Round your answers to the nearest ten-thousandth.

41) $15^m - 7 = 3$

42) $1.4 \cdot 2^b = 54$

43) $-8 \cdot 14^{-10n} = -88$

44) $-2 \cdot 3^{4a} = -30$

Solve each equation.

45) $-3 \log(n + 7) + 10 = -2$

46) $7 + 7 \log_8(n - 1) = -7$

47) $\log_{11} 5v = \log_{11} (8 - v)$

48) $\log_{11} (-3k - 4) = \log_{11} (3 - 2k)$

Identify the domain and range of each.

49) $y = \log_4(x + 4) - 4$

50) $y = \log_5(x - 1) + 2$

51) $y = \log_6(x - 3) + 2$

52) $y = \log_3(x - 1) + 4$

Solve each equation.

53) $|9x| = 72$

54) $|-10k| = 50$

55) $|n + 4| + 5 = 14$

56) $\left| \frac{v}{6} \right| + 10 = 11$

57) $|1 - 6n| = 25$

58) $|5v - 7| = 43$

Find the term named in the problem.

59) $-2, 4, -8, 16, \dots$

Find a_{10}

60) $-3, -6, -12, -24, \dots$

Find a_{12}

61) $3, 9, 27, 81, \dots$

Find a_{10}

62) $2, 6, 18, 54, \dots$

Find a_{10}

Given the explicit formula for a geometric sequence find the first five terms.

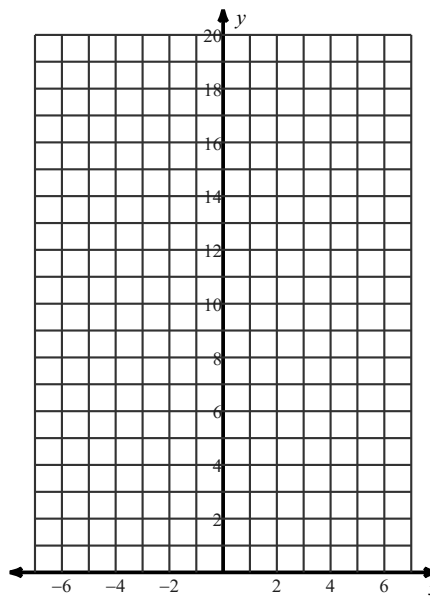
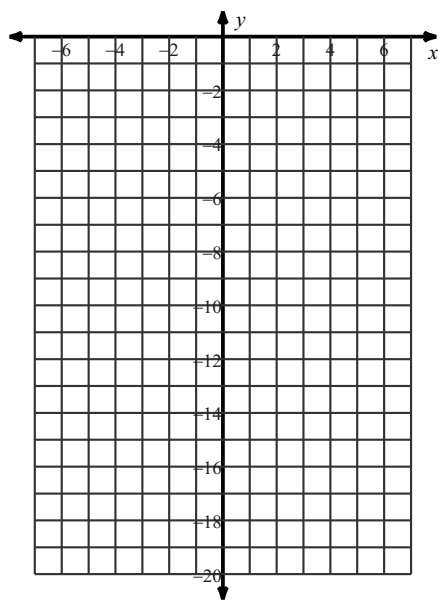
63) $a_n = -2 \cdot 2^{n-1}$

64) $a_n = 4^{n-1}$

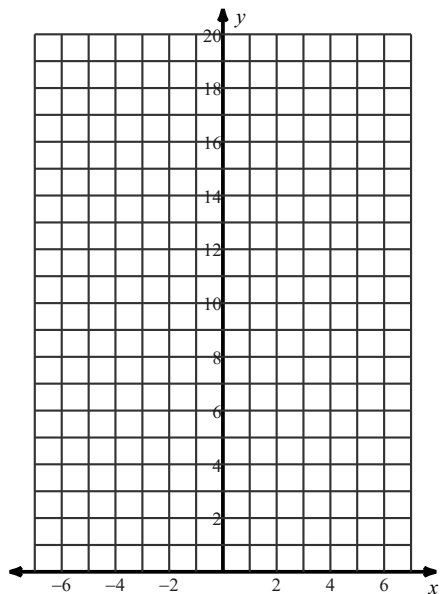
Sketch the graph of each function.

65) $y = -2 \cdot \left(\frac{1}{2}\right)^x$

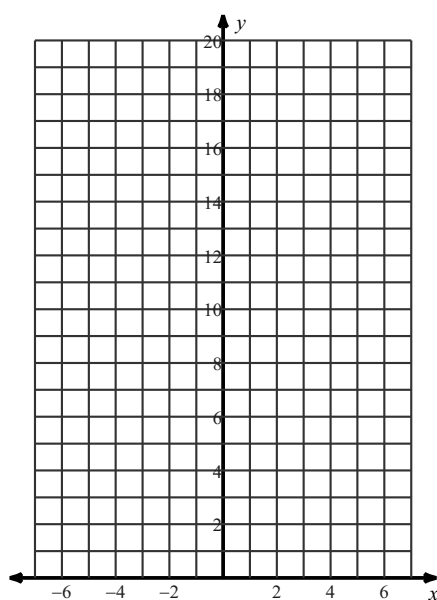
66) $y = \frac{1}{4} \cdot 3^x$



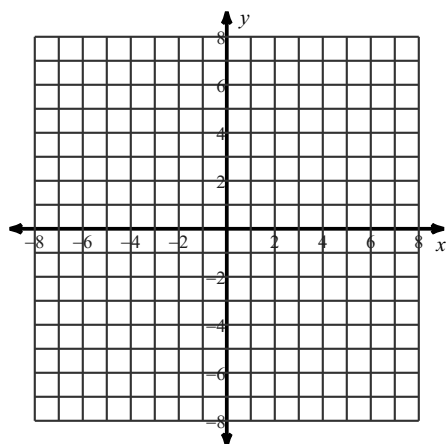
67) $y = \frac{1}{3} \cdot 6^x$



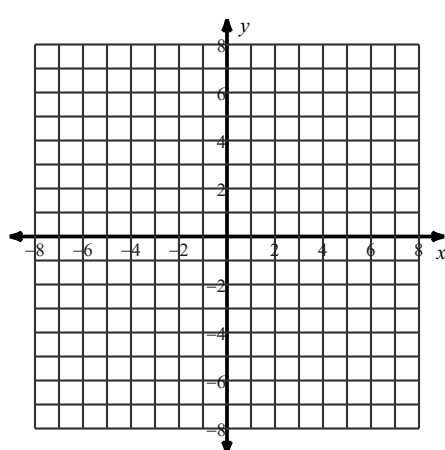
68) $y = 4 \cdot \left(\frac{1}{2}\right)^x$



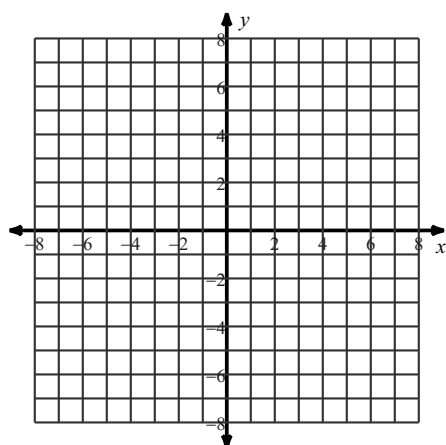
69) $y = \log(x - 1)$



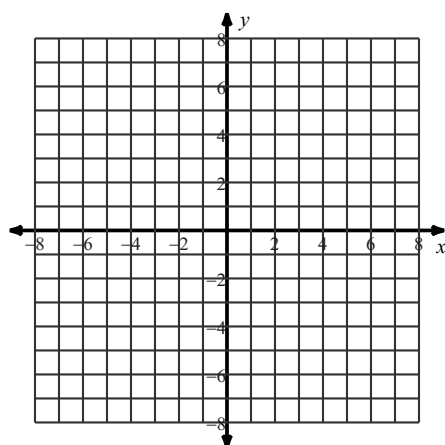
70) $y = \log_2(x - 1)$



71) $y = \log_5(x - 1) - 3$

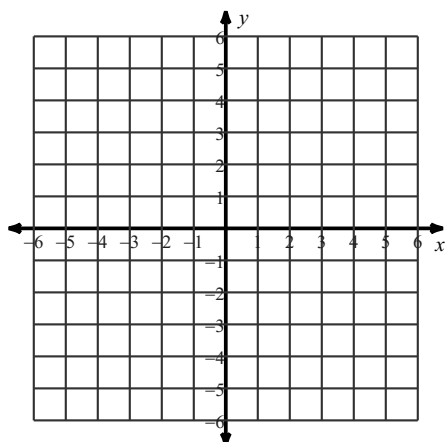


72) $y = \log_4(x - 1) - 3$

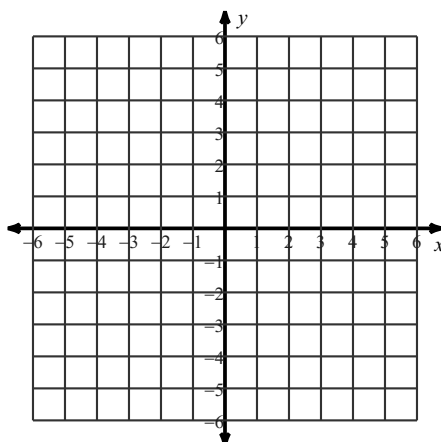


Graph each equation.

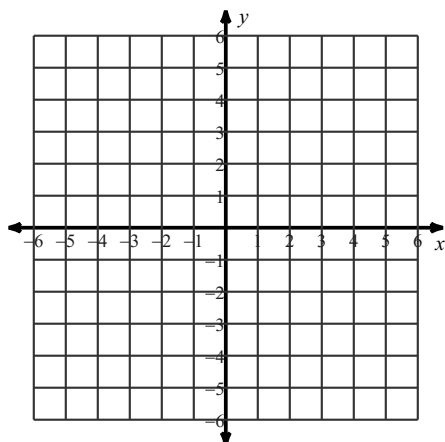
73) $y = 2|x + 2|$



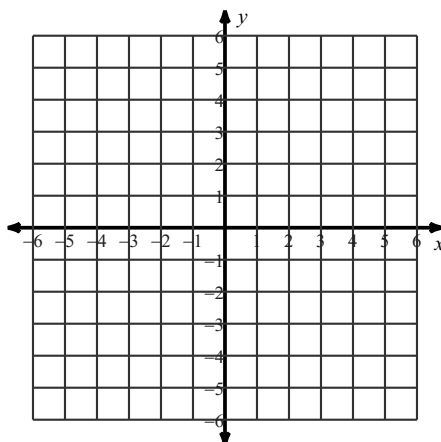
74) $y = 2|x - 2| + 2$



75) $y = -2|x - 3|$



76) $y = -2|x + 1| - 4$



Evaluate each geometric series described.

77) $-1 + 6 - 36 + 216 \dots, n = 7$

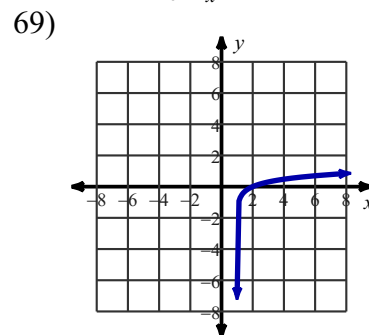
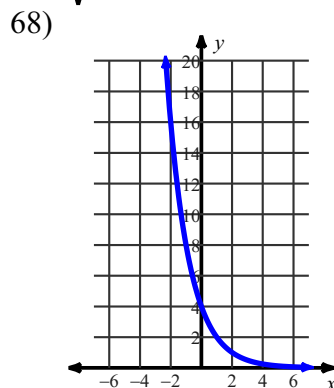
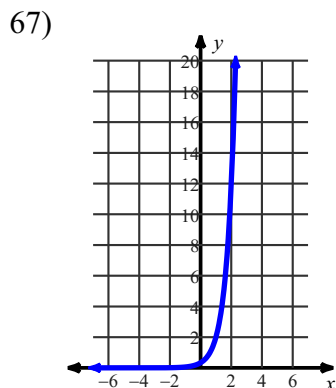
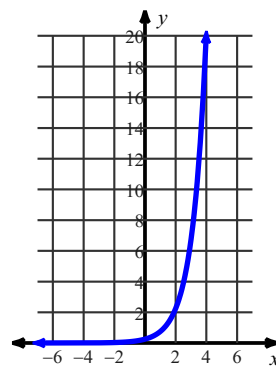
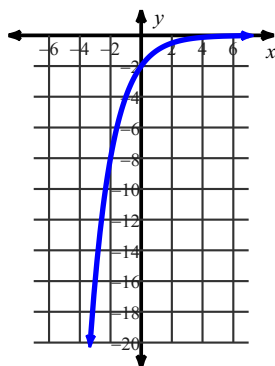
78) $-2 - 12 - 72 - 432 \dots, n = 7$

79) $\sum_{m=1}^7 -2 \cdot (-2)^{m-1}$

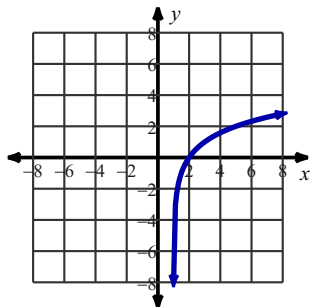
80) $\sum_{k=1}^7 -2 \cdot 5^{k-1}$

Answers to

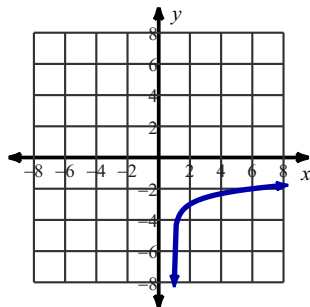
- | | | | |
|--|---|---|---|
| 1) $\{9\}$ | 2) $\{1\}$ | 3) $\left\{\frac{19}{5}\right\}$ | 4) $\left\{-\frac{5}{2}\right\}$ |
| 5) $\{-3\}$ | 6) $\left\{2, -\frac{3}{2}\right\}$ | 7) $\{-3\}$ | 8) $\{4\}$ |
| 9) $\{-9\}$ | 10) $\{2\}$ | 11) No solution. | 12) $\{10\}$ |
| 13) 2005 | 14) 5.76 hours | 15) 5.74 hours | 16) $24u^6v^4$ |
| 17) $\frac{16}{u^5}$ | 18) $\frac{4}{y^6}$ | 19) $\frac{a^8}{16}$ | 20) $\log_6(v^{12}u^2)$ |
| 21) $\log(y^6x^{18})$ | 22) $\log_3(vuw^4)$ | 23) $\log(v^4u^2)$ | 24) $\log_8\frac{x^4}{y^8}$ |
| 25) $6\log_9x - 12\log_9y$ | 26) $2\log_7u + 6\log_7v$ | 27) $2\log_6x - 5\log_6y$ | 28) $6\log_5u - 18\log_5v$ |
| 29) -3 | 30) 2 | 31) 6.129 | 32) 1.404 |
| 33) $x^y = 197$ | 34) $2^y = x$ | 35) $14^2 = a$ | 36) $16^v = u$ |
| 37) $\log_x y = -3$ | 38) $\log_m 100 = -5$ | 39) $\log_a 147 = b$ | 40) $\log_x 120 = y$ |
| 41) 0.8503 | 42) 5.2695 | 43) -0.0909 | 44) 0.6162 |
| 45) $\{9993\}$ | 46) $\left\{\frac{65}{64}\right\}$ | 47) $\left\{\frac{4}{3}\right\}$ | 48) $\{-7\}$ |
| 49) Domain: $x > -4$
Range: All reals | 50) Domain: $x > 1$
Range: All reals | 51) Domain: $x > 3$
Range: All reals | 52) Domain: $x > 1$
Range: All reals |
| 53) $\{8, -8\}$ | 54) $\{-5, 5\}$ | 55) $\{5, -13\}$ | 56) $\{6, -6\}$ |
| 57) $\left\{-4, \frac{13}{3}\right\}$ | 58) $\left\{10, -\frac{36}{5}\right\}$ | 59) $a_{10} = 1024$ | 60) $a_{12} = -6144$ |
| 61) $a_{10} = 59049$ | 62) $a_{10} = 39366$ | 63) $-2, -4, -8, -16, -32$ | |
| 64) 1, 4, 16, 64, 256 | 65) | 66) | |



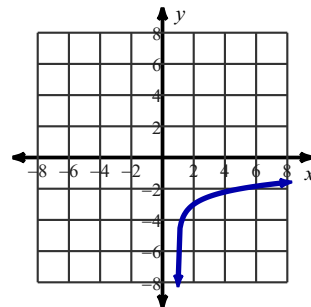
70)



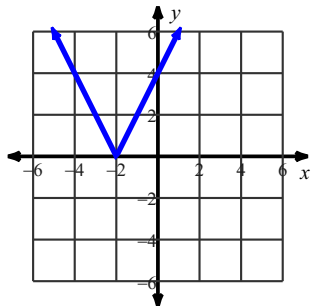
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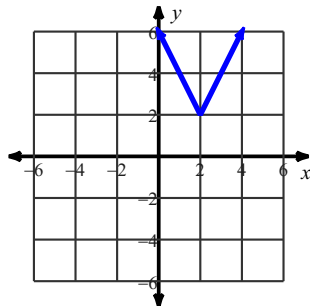
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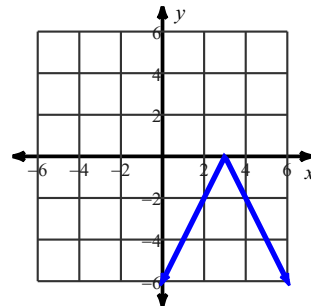
73)



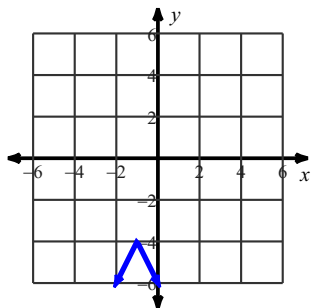
74)



75)



76)



77) -39991

78) -111974

79) -86

80) -39062