

RAMAPO-INDIAN HILLS SCHOOL DISTRICT

Dear Ramapo-Indian Hills Student:

Please find attached the summer packet for your upcoming math course. The purpose of the summer packet is to provide you with an opportunity to review prerequisite skills and concepts in preparation for your next year's mathematics course. While you may find some problems in this packet to be easy, you may also find others to be more difficult; therefore, you are not necessarily expected to answer every question correctly. Rather, the expectation is for students to put forth their best effort, and work diligently through each problem.

To that end, you may wish to review notes from prior courses or on-line videos (www.KhanAcademy.com, www.glencoe.com, www.youtube.com) to refresh your memory on how to complete these problems. We recommend you circle any problems that cause you difficulty, and ask your teachers to review the respective questions when you return to school in September. Again, given that math builds on prior concepts, the purpose of this packet is to help prepare you for your upcoming math course by reviewing these prerequisite skills; therefore, the greater effort you put forth on this packet, the greater it will benefit you when you return to school.

Please bring your packet and completed work to the first day of class in September. Teachers will plan to review concepts from the summer packets in class and will also be available to answer questions during their extra help hours after school. Teachers may assess on the material in these summer packets after reviewing with the class.

If there are any questions, please do not hesitate to contact the Math Supervisors at the numbers noted below.

Enjoy your summer!

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AP Calculus BC

Summer Assignment

Find the domain:

1. $f(x) = \sqrt{|x|}$

2. $f(x) = \frac{x}{|x|}$

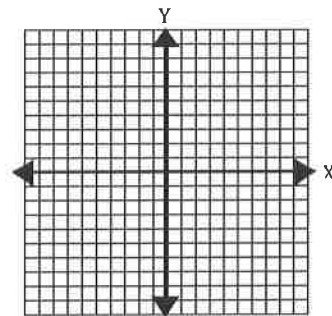
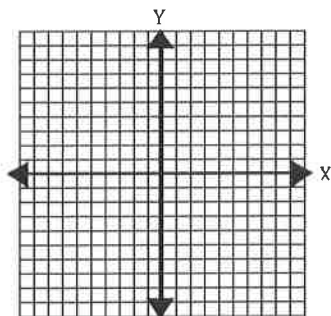
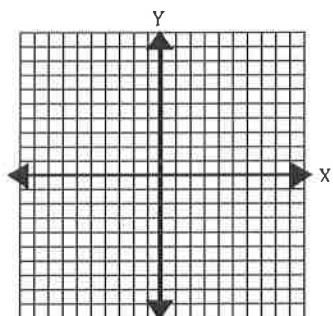
3. $f(x) = \sqrt{-x}$

Graph the following:

4. $f(x) = 2\log(x+2)$

5. $f(x) = \begin{cases} 1/x, & x < 0 \\ x, & 0 \leq x \end{cases}$

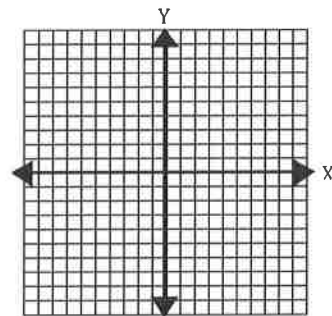
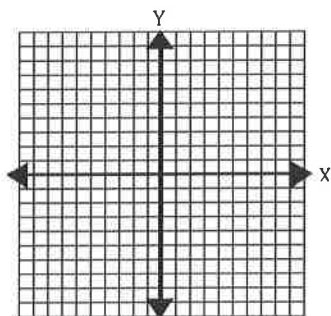
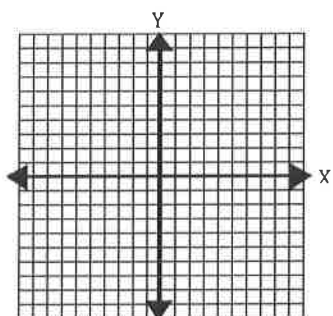
6. $f(x) = \frac{-1}{x^2}$



7. $f(x) = \begin{cases} x^2, & x > 0 \\ x-2, & x \leq 0 \end{cases}$

8. $f(x) = \sqrt{-x}$

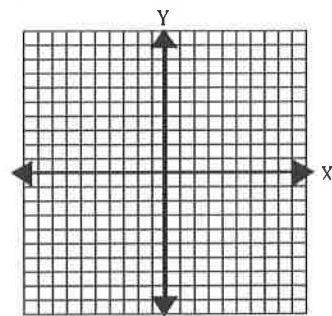
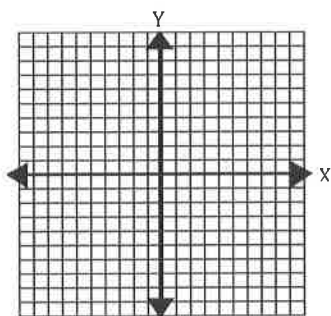
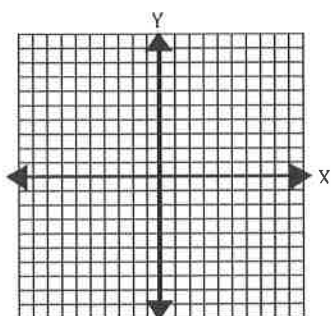
9. $f(x) = -e^{x+2}$



10. $f(x) = \sin(x - \pi)$

11. $f(x) = 2\cos(x) + 1$

12. $f(x) = \frac{x}{|x|}$



Show if the function is even, odd, or neither.

13. $f(x) = \frac{1}{x^2 - 1}$

14. $f(x) = 2|x| + 1$

15. $f(x) = x^{-5}$

Perform the following operations for: $f(x) = \sqrt{x}$, $g(x) = x/4$, $h(x) = 4x - 8$

16. $h(g(f(x)))$

17. $f(g(h(x)))$

18. $g(g(h(x)))$

19. $f(g(h(2)))$

20. $g(f(f(16)))$

21. $f(f(f(x)))$

Describe the transformations:

22. $f(x) = \sqrt{x+4}$

23. $f(x) = |1-x| - 1$

24. $f(x) = 1 - \sqrt{x}$

25. $f(x) = \frac{1}{x-2}$

26. $f(x) = \frac{1}{x^2} + 1$

27. $f(x) = (x-8)^{\frac{2}{3}}$

Given a continuous function f such that $f(x) = \{(x,y) | x \in [-4,0], y \in [-3,0]\}$, find domain and range.

28. $-f(x)$

29. $f(x+2)$

30. $f(x) - 1$

31. $2f(x)$

32. $f(-x)$

33. $-f(-x)$

Find the exact value.

$$34. \csc\left(\frac{9\pi}{4}\right) =$$

$$35. \cos\left(\frac{5\pi}{6}\right) =$$

$$36. \sec\left(\frac{13\pi}{6}\right) =$$

$$37. \tan\left(\frac{23\pi}{4}\right) =$$

$$38. \sin\left(\frac{13\pi}{3}\right) =$$

$$39. \sec\left(\frac{-7\pi}{3}\right) =$$

$$40. \sin^{-1}\left(\frac{1}{2}\right) =$$

$$41. \cos^{-1}\left(\frac{-\sqrt{2}}{2}\right) =$$

$$42. \tan^{-1}(1) =$$

Prove the following:

$$43. \frac{\tan x + \tan y}{\cot x + \cot y} = \tan x \tan y$$

$$44. \frac{1 + \sin x}{1 - \sin x} - \frac{1 - \sin x}{1 + \sin x} = 4 \tan x \sec x$$

Solve on the interval $0 \leq \theta \leq 2\pi$

$$45. \sin x = -.5$$

$$46. \cot x = -1$$

$$47. 2\sin^2 x + \sin x = 1$$

Simplify:

$$48. 4\log_{\frac{1}{3}} 9\sqrt{27}$$

$$49. 4\log_2 \sqrt{.125}$$

$$50. \log_8 \sqrt[3]{\frac{1}{16}}$$

$$51. 3\log_{\frac{4}{9}} \sqrt[4]{\frac{27}{8}}$$

$$52. \log_4 2\sqrt[5]{8} - \log_8 \sqrt[3]{.25}$$

$$53. \log_{16} \frac{2}{3} + \log_{16} 96$$

Solve:

54. $\log x + \log(x+1) = \log 12$

55. $5 \ln(3-x) = 4$

56. $\log_2(x+2) + \log_2(x-1) = 2$

Find the zeros:

57. $P(x) = x^3 - x - 6$

58. $P(x) = x^4 + x^3 + 7x^2 + 9x - 18$

59. $P(x) = x^4 - 81$

60. $P(x) = x^4 + 15x^2 + 54$

61. $P(x) = x^6 - 64$

62. $P(x) = 2x^3 + 5x^2 - 6x - 9$

Solve the inequality. Express the solution in interval notation.

63. $\frac{(x-1)^2}{(x+1)(x+2)} > 0$

64. $\frac{x^2 - 16}{x^4 - 16} > 0$

65. $x^5 > x^2$

Use partial fractions to re-write the following:

66. $\frac{7x}{(2x-3)(x+2)}$

67. $\frac{5x-7}{x^2-3x+2}$

68. $\frac{-2x+4}{(x^2+1)(x-1)^2}$

Find the nth term of each sequence:

69. $e^{-x}, e^{-x^2}, e^{-x^3}, e^{-x^4}, \dots$

70. $\sqrt{3}, \sqrt{3\sqrt{3}}, \sqrt{3\sqrt{3\sqrt{3}}}, \dots$

71. $0, 2, 0, 2, 0, \dots$

Find the following:

72. $(-3, 2) \cap [1, 4] \cap (1, 3)$

73. $a \text{ x s.t. } x \in \mathbb{Q} \text{ and } x \notin \mathbb{Z}$

74. $(0, \infty) \cap [-1, 3]$