

Algebra 2B  
Spring Semester Final Review  
2009

1.  $(3p^4 + 7p^2 - 13) - (p^4 + 4p^3 - 10) =$

2.  $(z^2 + 5z + 9) + (z^2 - 5z - 25) =$

3. What is the distance between the points  $(-1, -3)$  and  $(4, 9)$ ?

4.  $(2x + 7)(x - 13) =$

5. Write a quadratic function in vertex form that has a vertex of  $(5, 4)$  and passes through the point  $(7, 0)$ .

6. Solve by completing the square:  $4x^2 - 40x + 51 = 0$

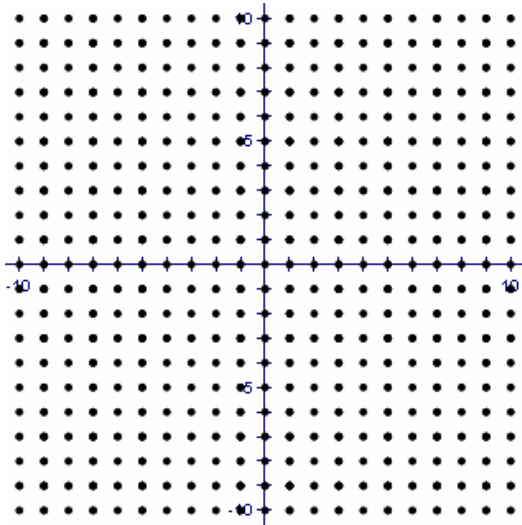
7. Use the quadratic formula to solve:  $x^2 - 34 = 12x$

8. Find the solution(s) to the quadratic equation:  $x^2 - 12x + 100 = 0$

9. Find the solution(s) to the quadratic equation:  $x^2 + 52 = 8x$

10. Find the solution(s) to  $x^2 - 10x + 22 = 0$ :

11. Graph the function  $f(x) = (x - 3)^2 - 7$



12. Determine the number of real solutions for the quadratic:  $16x^2 + 19x + 6 = 0$

13. Determine whether there are 2 irrational solutions, 2 rational solutions, 2 imaginary solutions, or 1 rational solution to the equation  $x^2 + 119 = 22x$ .

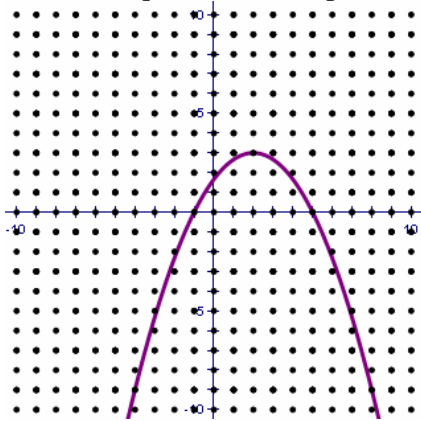
14. An arrow shot into the air is  $24.5t - 4.9t^2$  meters above the ground  $t$  seconds after it is released.

a. How high does it go?

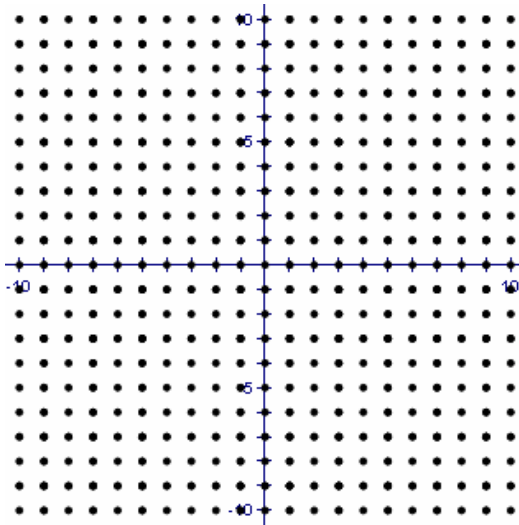
b. How long does it take to get to its maximum height?

c. How many seconds does it take for the arrow to hit the ground?

15. Write an equation for the parabola shown:



16. Graph:  $y > (x-4)^2 - 3$



17. Write the expression as a complex number in standard form:  
 $2 + i - 4(3 - 2i) =$

18. Divide:  $\frac{14 + 5i}{4 - i} =$

19. Find the vertical and horizontal asymptotes:  $f(x) = \frac{1}{2x + 3} + 6$

20. Multiply:  $(x + 5)\left(\frac{x + 2}{x^2 - 25}\right) =$

21. Divide the rational expressions:  $\frac{x^2 - 4}{x^2 + 4x - 24} \div \frac{x + 2}{x - 5} =$

22. Add:  $\frac{1}{x - 2} + \frac{3}{x + 2} =$

23. Solve the rational equation for  $x$ :  $\frac{x + 5}{x + 1} + 4 = \frac{x + 9}{x + 5}$

24. What are the solutions of the equation  $x = \frac{18}{x + 3}$ ?

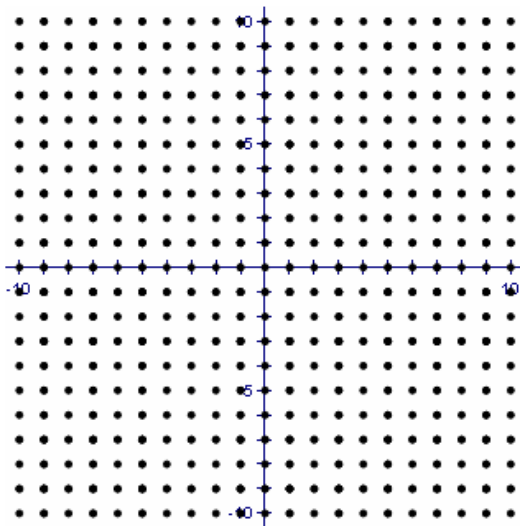
25. Simplify:  $\sqrt{243} + 4\sqrt{27} =$

26. Solve the equation for  $x$ :  $\sqrt{x+56} = x$

27. Solve for  $x$ :  $3 = -1 + \sqrt{x+13}$

28. Solve for  $x$ :  $x = \sqrt{3x+10}$

29. Graph:  $y = \sqrt{x+6} - 3$



30. Simplify:  $\frac{x^2 y^6}{z^3} \cdot \frac{y^3 z^{-2}}{x^4} =$

31. Solve the rational equation for  $x$ :  $\frac{x}{x-5} + \frac{3}{x-1} = -3$

32. Find the quotient and simplify:  $\frac{x^2 + 9x + 14}{x+7} \div \frac{x+2}{x-5} =$

33. Find the product and simplify:  $\frac{x^2 - 4x - 12}{x^2} \cdot \frac{x^2 - 6x}{x+2} =$

34. Solve for  $a$ :  $\frac{a}{a-4} + \frac{5}{a} = 6$

35. Simplify and give the answer in exponential form:  $(x^3 \cdot y^2)^5 =$

36. Simplify:  $\left(\frac{a^{13}}{\sqrt{b}}\right)^2 =$

37.  $\sqrt{49a^{-6}} =$

38.  $\sqrt{\frac{8a^5b^6}{9c^2}} =$

39.  $(27x^9)^{\frac{2}{3}} =$

40. State the domain and range of each of the following functions:

a.  $y = (x-3)^2 - 1$

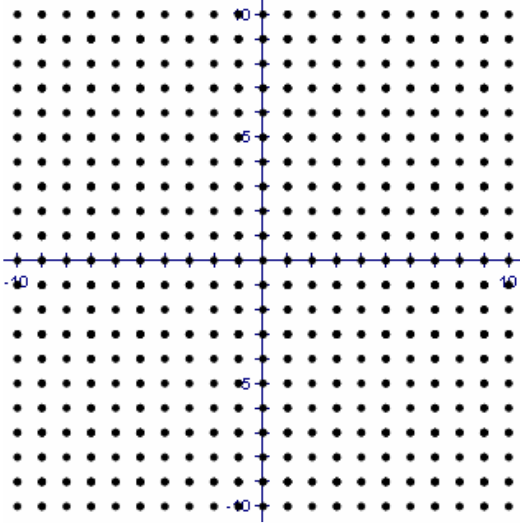
b.  $y = \sqrt{x+3} + 6$

c.  $y = \frac{1}{x-2} + 5$

d.  $y = 6^x - 4$

41. The variable  $x$  varies inversely with  $y$ . When  $x = 3$ ,  $y = -6$ . Write the equation that relates  $x$  and  $y$ .

42. Graph the function  $xy = 6$



43. Simplify:  $\frac{6a^6}{4a^4}$ ?

44. Match the function with its type:

$$y = 1.08^x$$

$$y = 4(x+1)(x+6)$$

$$y = 0.5^x$$

$$y = 3(x-2)+1$$

A. Linear function

B. Quadratic function

C. Exponential growth function

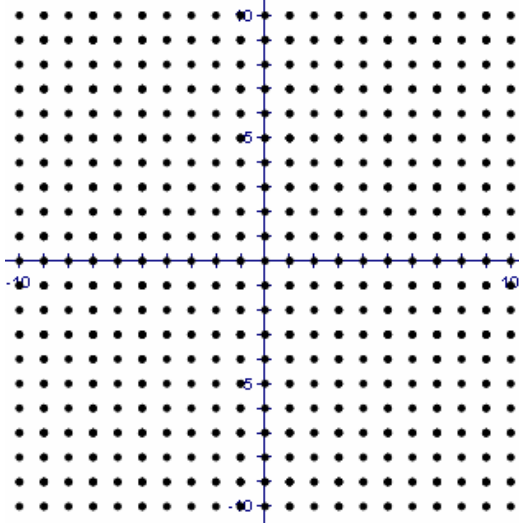
D. Exponential decay function

45.  $\log_7 7^6 =$

46. If  $\log_n 5 = x$ , then  $\log_n 125 =$

47. Solve:  $4^{x+1} = 8^x$

48. Graph the function  $f(x) = 2^x$ :



49. What is the asymptote of the graph of  $f(x) = \log_4 x$ ?

50. Match the logarithm with its equivalent expression:

$y \log_a x$

$\log_a \frac{x}{y}$

$\frac{1}{y} \log_a x$

$\log_a(xy)$

A.  $\log_a x - \log_a y$

B.  $\log_a x + \log_a y$

C.  $\log_a x^y$

D.  $\log_a \sqrt[y]{x}$

51. Rewrite in exponential form:  $\log_4 128 = 3.5$ .

52. Simplify:  $\left(4^{1.5} \cdot 27^{\frac{1}{3}}\right)^2 =$

53. Simplify:  $\frac{a^5 b^2}{a^7 b^{-5}} =$

54. Solve for  $x$ :  $2 \log x = \log 3 + \log(x + 6)$

55. Solve for  $y$ :  $\log_2(z - 2) - \log_2(z - 4) = 1$