

Pre Cal Summer - Algebra 2 Review Packet

Objective 1: Solving Equations & Inequalities

Solve for the variable, show all work. (NO DECIMAL ANSWERS)

1. $6x - 2 = 5x - 7 - 3x$

2. $3(8x - 5) = -4(7 - 6x)$

3. $3(x - 5) + 8x = 18 - (3 - 10x)$

4. $3(8x - 5) + 3 = 22x + 2(x - 6)$

5. $5x - \frac{1}{4} = 3x - \frac{5}{4}$

6. $4x - 15 = 6x + 5 - 2x$

7. $\frac{m}{3} + \frac{1}{3} = \frac{2}{3}$

8. $-8x - (3x - 6) = 4 - x$

9. $-5x + 4(x + 5) = x + 20$

10. $\frac{5}{7}(k + 5) = -7$

Solve and graph on a number line

11. $2x + 4(x - 2) > 4$



12. $4 - (2x - 4) \geq 5 - (4x + 3)$



13. $-4x + 6 < 22$



14. $-7 \leq 2x - 3$



Objective 2: Polynomials

Simplify:

15. $7x^2 + 4x - 3) - (-5x^2 - 3x + 2)$

16. $(n^2 + 5n + 3) + (2n^2 + 8n + 8)$

17. $(4x + 5)(5x + 4)$

18. $-2x(5x + 11)$

19. $(5x^2 - 4) - 2(3x^2 + 8x + 4)$

20. $(5x - 6)^2$

21. x^2x^4

22. $\frac{n^4 \cdot n^6}{n^8 \cdot n^2}$

23. $\frac{x^8}{x^6}$

24. $(x^3)^7$

25. $\frac{n^3}{n^5}$

26. $(2a)^3(b^{-4})$

Factor:

Factor out the GCF

27. $6x^2 + 21x$

28. $5x^2y^3 - 15xy + 20xy^4$

Difference of Squares

29. $x^2 - 16$

30. $4x^2 - 1$

31. $100x^2 - 81$

Factor trinomials

32. $x^2 - 2x - 63$

33. $x^2 + 10x + 16$

34. $2x^2 - 13x + 15$

35. $x^2 - 8x + 16$

36. $x^2 + 19x - 20$

37. $x^2 + 5x + 6$

Evaluate

38. Find $P(5)$ given $P(x) = 4x^2 - 1$

39. Find $Q(-2)$ given $Q(x) = -2x^3 + x^2 - 6$

Objective 3: Linear Equations

Find the slope of the line passing through the following points:

40. $(9, 6)$ $(1, 4)$

41. $(5, -12)$ $(15, -2)$

42. $(3, 0)$ $(3, 5)$

43. $(-3, -5)$ $(-2, -7)$

44. $(4, 5)$ $(-1, 5)$

45. Parallel lines have _____ slopes.

46. Perpendicular lines have _____ slopes.

47. Horizontal lines have a slope of _____.

48. Vertical lines have a slope of _____.

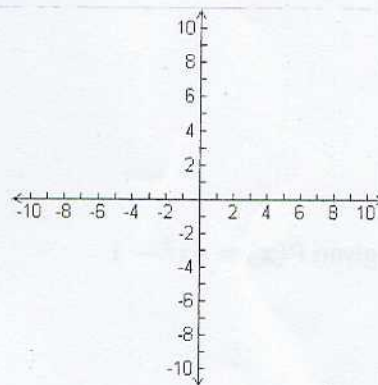
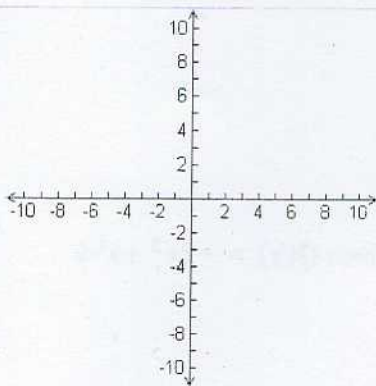
Using the slope and y-intercept, sketch a graph of each line. ($y=mx+b$) m =slope, b =y-intercept

49. $y = 2x - 1$

Slope _____, y-int _____

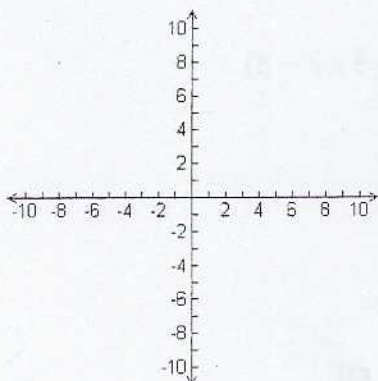
50. $y = \frac{-2}{3}x + 3$

Slope _____, y-int _____

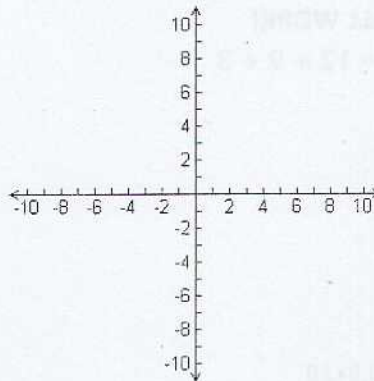


Change the following to slope-intercept form, then sketch the graph.

51. $3x - 4y = 12$



52. $3x + 6y = 12$



Write an equation, in slope-intercept form, using the given information.

53. $m = \frac{1}{2}$ y-intercept (0,3)

54. $m = -3$, (2, 4)

Objective 4: Solving Systems of Equations. Use Substitution Method or Elimination Method.

55. $2x + y = -6$
 $3x + y = -10$

56. $-7y + 15 = 3x$
 $15 = 3x + 2y$

57. $y = 5 - 4x$
 $3x - 2y = 12$

58. $3x + 2y = 8$
 $x = 3y + 10$

ABSOLUTELY NO CALCULATORS ON THIS PAGE!

Objective 5: Basic Math skills (Fractions & Order of Operations)

Simplify: SHOW ALL WORK!

59. $6 + 2 \times 8 - 12 + 9 \div 3$

60. $25 - (2^3 + 5 \times 2 - 3)$

61. $\frac{-2 \cdot -30 + 0.5 \cdot 20}{4^2 - 6}$

62. $\frac{15 - [8 - (2 + 5)]}{18 - 5^2}$

63. $\frac{2}{5} + \frac{2}{3}$

64. $3 - 1\frac{1}{5}$

65. $5 \times 3\frac{1}{2}$

66. $\frac{3}{8} \div \frac{1}{4}$

Simplify each expression

1) $\frac{40p^3}{72p^2}$

2) $\frac{4x^2 - 24x + 20}{2x^3 - 12x^2 + 10x}$

Simplify each expression.

3) $\frac{a-7}{21-3a} \cdot \frac{a-1}{8a}$

4) $\frac{9n-9}{6} \cdot \frac{6}{n-1}$

5) $\frac{v^2 + 14v + 45}{v+3} \div \frac{v^2 + 14v + 45}{v+10}$

6) $\frac{15x^2 + 30x}{27x^3 + 54x^2} \div \frac{5x}{3}$

7) $\frac{3n}{n+1} + \frac{6}{n+3}$

8) $\frac{3x-1}{6x^2+9x} - \frac{4}{3x}$

9) $\frac{2x}{x^2-2x-8} - \frac{5}{4}$

10) $\frac{6m}{5m^2} + \frac{m-1}{m^2-5m+6}$

olve each equation. Remember to check for extraneous solutions.

$$1) \frac{1}{2b^2} = \frac{1}{2b} + \frac{1}{b^2}$$

$$12) \frac{1}{m} + \frac{m-6}{2m} = 1$$

$$3) \frac{1}{a^2+9a+18} = \frac{2}{a^2+9a+18} - \frac{1}{a+6}$$

$$14) \frac{1}{2p-10} = \frac{5}{2} - \frac{2}{p-5}$$

implify each expression.

$$5) \frac{\frac{5}{m-2}}{\frac{m^2}{5}}$$

$$16) \frac{\frac{x}{9}}{\frac{1}{x}}$$

$$7) \frac{\frac{16}{m^2} - \frac{m+3}{m}}{4}$$

$$18) \frac{\frac{x-3}{x-5} + \frac{x-5}{5}}{\frac{25}{x-5}}$$

implify.

$$9) \sqrt{28ab^2}$$

$$20) \sqrt{48x^3y^3}$$

$$1) \sqrt[3]{81}$$

$$22) \sqrt[3]{32}$$

Write each expression in radical form.

$$23) (3m)^{\frac{2}{5}}$$

$$24) b^{\frac{3}{2}}$$

Write each expression in exponential form.

$$25) \sqrt[3]{6m}$$

$$26) \sqrt[4]{10x}$$

Simplify.

$$27) (x^4)^{-\frac{3}{4}}$$

$$28) (a^6)^{-\frac{2}{3}}$$

$$29) (125v^3)^{\frac{1}{3}}$$

$$30) \frac{2u^2v^{-3}}{2u^{-1} \cdot (u^2v^{-2})^3}$$

$$31) \frac{(x^4y^{-3} \cdot 2y^4)^2}{2x^{-1}y^4}$$

$$32) \frac{\left(x^2y^{\frac{1}{2}} \cdot xy^{-\frac{1}{2}}\right)^2}{x^{\frac{3}{2}}}$$

$$33) -3\sqrt{15}(\sqrt{6} + \sqrt{5})$$

$$34) (3 - 4\sqrt{2})(3 - 2\sqrt{2})$$

$$35) 3\sqrt{3} - 3\sqrt{5} + 3\sqrt{5}$$

$$36) -\sqrt{20} - \sqrt{45} + 2\sqrt{5}$$

$$37) \frac{3}{4 + \sqrt{3}}$$

$$38) \frac{5}{-2 + \sqrt{2}}$$

Solve each equation. Remember to check for extraneous solutions.

9) $\sqrt{3x-8} = 4$

40) $\sqrt{35-2x} = 5$

1) $k = \sqrt{2-k}$

42) $-18 = -9\sqrt{x+4}$

3) $n+3 = \sqrt{6n+25}$

44) $4 = -a + \sqrt{6a+15}$

Solve each equation by completing the square.

5) $4v^2 - 16v - 51 = -10$

46) $5x^2 - 20x - 62 = -2$

7) $n^2 - 2n - 109 = -10$

48) $a^2 - 16a + 50 = -5$

Solve each equation by factoring.

49) $x^2 = -9x - 20$

50) $x^2 - 12 = 4x$

51) $7n^2 + 18n + 8 = 0$

52) $5k^2 + 6k + 1 = 0$

Solve each equation by taking square roots.

53) $-5x^2 = -80$

54) $6p^2 = 180$

55) $5n^2 = -200$

56) $m^2 + 3 = 67$

Solve each equation with the quadratic formula.

57) $5x^2 + 7x + 3 = 0$

58) $3x^2 - 8x - 16 = 0$

59) $12a^2 - 8a = -11$

60) $n^2 + 6n = 13$

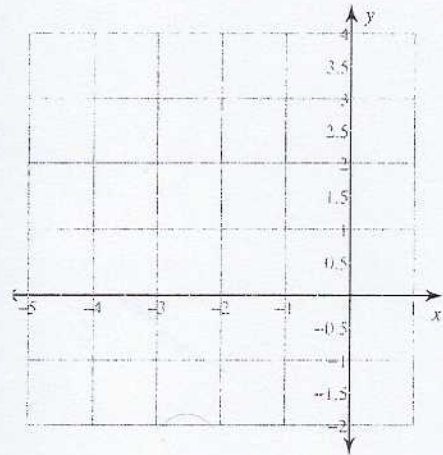
Find the discriminant of each quadratic equation then state the number and type of solutions.

1) $-8v^2 + 6v = 0$

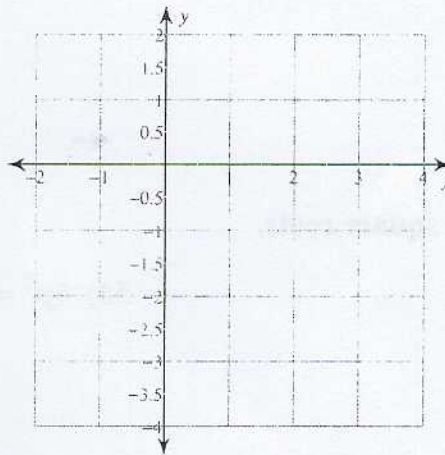
62) $-2x^2 - 5x + 3 = 0$

Sketch the graph of each function.

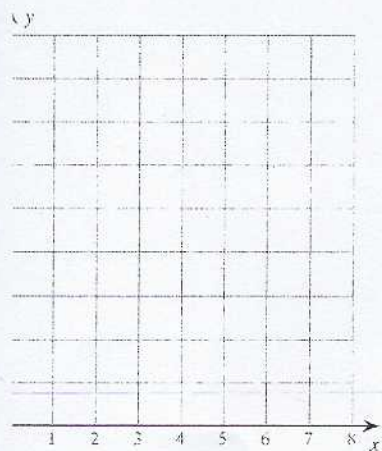
3) $y = x^2 + 4x + 3$



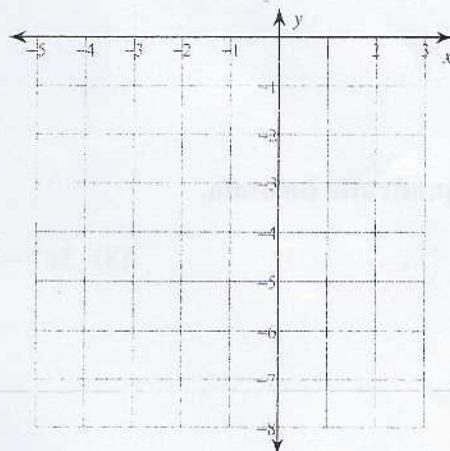
64) $y = x^2 - 2x - 2$



5) $f(x) = (x - 2)^2 + 4$



66) $f(x) = -(x + 3)^2 - 3$



Evaluate each expression.

67) $\log_9 3$

68) $\log_4 64$

69) $\log_2 \frac{1}{64}$

70) $\log_2 4$

71) $\log_{36} \frac{1}{6}$

72) $\log_6 216$

Condense each expression to a single logarithm.

73) $4 \ln 8 + 12 \ln 7$

74) $8 \log_3 u - 4 \log_3 v$

75) $16 \ln a + 4 \ln b$

76) $8 \log 6 - 4 \log 7$

Expand each logarithm.

77) $\log_4 \left(\frac{x^3}{y} \right)^6$

78) $\log_6 \sqrt[3]{u \cdot v \cdot w}$

79) $\log_7 (x \cdot y \cdot z^2)$

80) $\log_8 \frac{x^4}{y^3}$

Solve each equation.

$$1) \ln(2n + 8) = \ln(-4n - 4)$$

$$82) \log_{14}(3r - 3) = \log_{14}(2r + 5)$$

$$3) \log_5(x^2 + 3) - \log_5 3 = \log_5 49$$

$$84) \log_4 5x^2 - \log_4 5 = 5$$

$$5) \log_5 4x^2 - \log_5 2 = \log_5 2$$

$$86) \log_8 3 - \log_8 5x = 1$$

Solve each equation by changing the base.

$$7) 64^{-x} = 32^{2x+3}$$

$$88) \left(\frac{1}{243}\right)^{2v-2} = \frac{1}{9}$$

$$9) 64^{-3n} = 16^{-3n}$$

$$90) 243^{-2a} = \left(\frac{1}{3}\right)^{-3a-2}$$