FBMS Summer
Geometry Packet
Due: August 22, 2022
Solving Equations in One Variable

Solve

1. \( \frac{3y-2(y-1)}{6} = -1 \)

2. \( 3(x - 2) - x = 2(2x - 1) \)

3. \( 3(180 - y) = 2(90 - y) \)

4. \( 6x - 3(6 - 5x) + 3x = 10 - 4(2 - x) \)

5. \( \frac{1}{2} (6 + 4x) - \frac{1}{4} (8x - 12) = \frac{1}{2} (2x - 4) \)

6. \( 5x - [7 - (2x - 1)] = 3(x - 5) + 4(x + 3) \)

Solve each system of equations by the substitution method.

7. \( y = 2x + 5 \) \hspace{2cm} 8. \( 8x + 3y = 26 \) \hspace{2cm} 9. \( x - 8 = 3 + y \)
   \( 3x - y = 4 \) \hspace{2cm} \( 2x = y - 4 \) \hspace{2cm} \( 2x - 5y = 8 \)

10. \( x - 7y = 13 \) \hspace{2cm} 11. \( 3x + 2y = 71 \) \hspace{2cm} 12. \( 3x + y = 19 \)
    \( 3x - 5y = 23 \) \hspace{2cm} \( y = 4 + 2x \) \hspace{2cm} \( 2x - 5y = -10 \)

Solve each system of equations using the elimination method.

13. \( 3x + 4y = 9 \) \hspace{2cm} 14. \( 4x - 6y = -26 \) \hspace{2cm} 15. \( 5x + 3y = 30 \)
    \( -3x - 2y = -3 \) \hspace{2cm} \( -2x + 3y = 13 \) \hspace{2cm} \( 3x + 3y = 18 \)

16. \( 2x - 8y = 24 \) \hspace{2cm} 17. \( 3x + y = -3 \) \hspace{2cm} 18. \( 5x - 9y = 47 \)
    \( 3x + 5y = 2 \) \hspace{2cm} \( x + 4y = 10 \) \hspace{2cm} \( 6x + 2y = 18 \)
The Coordinate Plane

Name the coordinates of each point.

19. M  24. T
22. R  27. W
23. S  28. Q

29. Name all the points shown that lie on the x-axis.

30. Name all the points shown on the y-axis.

31. What is the x-coordinate of every point that lies on a vertical line through P?

32. Which of the following points lie on a horizontal line through W?

   (-2,1)   (2,3)   (1,-3)   (-2,0)   (0,-3)   (2,0)

Name all the points shown that lie in the quadrant indicated. (A point on an axis is not in any quadrant)

33. Quadrant I  34. Quadrant II  35. Quadrant III  36. Quadrant IV

Plot each point on the graph above.

37. A (2,1)  38. B (5,0)  39. C (0,3)  40. D (-3,1)
41. E (-2,1)  42. F (1,-2)  43. G (4,-2)  44. H (-4,-3)
Simplify the following fractions

45. \( \frac{14}{70} \)  
46. \( \frac{75}{15} \)  
47. \( \frac{18a}{36} \)  
48. \( \frac{3x}{x} \)

49. \( \frac{x}{3x} \)  
50. \( \frac{5bc}{10b^2} \)  
51. \( \frac{-8y^3}{2y} \)  
52. \( \frac{-18r^3t}{12rt} \)

53. \( \frac{3ab^2}{6bc} \)  
54. \( \frac{6a+12}{6} \)  
55. \( \frac{9x-6y}{3} \)  
56. \( \frac{33ab-22b}{11b} \)

Solve each equation by factoring

57. \( x^2 + 5x - 6 = 0 \)
58. \( x^2 - 7x - 18 = 0 \)
59. \( x^2 = 20x - 36 \)
60. \( x^2 + 8x = 20 \)
61. \( 4x^2 + 15 = 17x \)
62. \( 3x^2 - 13x - 10 = 0 \)
63. \( 6x^2 + 11x - 10 = 0 \)
64. \( 8x^2 + 10x - 25 = 0 \)
Solve the following proportions

65. \( \frac{7}{2} = \frac{y}{3} \)  
66. \( \frac{7}{3} = \frac{21}{x} \)  
67. \( \frac{5}{25} = \frac{10}{x} \)

68. \( \frac{10}{6x+7} = \frac{6}{2x+9} \)  
69. \( \frac{4}{x-3} = \frac{6}{x+3} \)  
70. \( \frac{3x-5}{2} = \frac{x-15}{4} \)

71. \( \frac{2-4x}{-6} = \frac{6x-8}{10} \)  
72. \( \frac{x+2}{5} = \frac{4}{x+1} \)  
73. \( \frac{2}{x-3} = \frac{x-2}{6} \)

The Slope of a Line

Given two points, find the slope

74. \((3, -4)\) and \((3, -2)\)  
75. \(\left(\frac{3}{2}, -3\right)\) and \(\left(\frac{1}{2}, -7\right)\)

Graphs of Linear Equations in Two Variables

Graph the following

76. \(2x + 5y = 15\)
Finding the Equation of a Line

Write the equation of the line in both **standard form** $Ax + By + C = 0$ and **point-slope form** $y - y_1 = m(x - x_1)$ that has the given conditions.

77. Contains the point $(-4,-2)$ and has slope $\frac{1}{2}$
78. Contains the points $(3,-2)$ and $(2,-3)$
79. Perpendicular to the line $4x - y = -3$ and passes through the point $(-8,3)$
80. Contains the points $(-3,0)$ and $(0,-1)$

Algebraic Solving of Systems of Linear Equations in Two Variables

Solve the system of equations.

81. $8x - 3y = 3$ \hspace{1cm} 82. $6x = 4y + 5$
   $3x - 2y + 5 = 0$ \hspace{1cm} $6y = 9x - 5$

Products and Quotients of Rational Expressions

Factor Completely

83. $100a^2 - 36b^2$ \hspace{1cm} 84. $16x^2 + 40xy + 25y^2$ \hspace{1cm} 85. $6x^2 - 7x - 3$
86. $x^4 - 2x^2 + 1$ \hspace{1cm} 87. $16x^3 - 64x^2$ \hspace{1cm} 88. $4k^2 + 20k + 25$
89. $25j^2 - 80j + 64$ \hspace{1cm} 90. $5x^2 + 13x + 6$ \hspace{1cm} 91. $x^2 - 10xy + 24y^2$

Pythagorean Theorem \hspace{1cm} $a^2 + b^2 = c^2$

Find the missing side length.

92. $a = 3, c = 5$ \hspace{1cm} 93. $a = 4, b = 6$ \hspace{1cm} 94. $a = 42, b = 40$ \hspace{1cm} 95. $a = 60, c = 68$

Find the value of $x$.

96. $a = 2x, b = 2x + 4, c = 4x - 4$