

Student's Name \_\_\_\_\_

**Summer Packet for Students entering Geometry**  
**(Students who have successfully completed Algebra I)**  
**COMPLETED PACKET is due on the FIRST DAY OF SCHOOL!**

**I. Solving Linear Equations**

**Find the value of the variable. Show your work!**

Ex.: $x + 5 = 12$ $x + 5 - 5 = 12 - 5$ $x = 7$	1. $8 + x = 13$	2. $X - 5 = 11$
3. $6 - x = 21$	4. $4x = 36$	5. $-5x = 20$
6. $12 = \frac{x}{2}$	7. $-9 = \frac{x}{3}$	8. $12 = 3x - 9$
9. $8x - 2x = 66$	10. $3x + (x - 2) = 10$	11. $4x + 23 = 9x - 7$
12. $180 - x = 3(90 - x)$	13. $2(x + 5) = 3(x - 2)$	14. $(4x + 5) + (5x + 40) = 180$
15. $5 = 15x$	16. $\frac{4x}{5} = -20$	17. $\frac{2x-1}{5} - 3 = 7$
18. $2x + 3 = 5x - 9$	19. $7x = 180 - 2x$	20. $2(x - 5) + 7 = 11 - x$

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Solve each system of equations by the substitution method:

<p><b>Example:</b> <math>y = 5 - 2x</math> (1) <math>5x - 6y = 21</math> (2)</p> <p>Substitute <math>5 - 2x</math> for <math>y</math> in (2) <math>5x - 6(5 - 2x) = 21</math></p> <p>Apply the distributive prop. <math>5x - 30 + 12x = 21</math></p> <p>Collect similar terms; solve for <math>x</math> <math>17x = 51</math>; <math>x = 3</math></p> <p>Substitute <math>x = 3</math> into equation (1) <math>y = 5 - 2(3) = -1</math></p> <p><b>Solution is (3,-1)</b></p>	21. $y = 3x$ $5x + y = 24$	22. $X = 8 + 3y$ $2x - 5y = 8$
23. $3x + 2y = 71$ $y = 4 + 2x$	24. $x - 7y = 13$ $3x - 5y = 23$	25. $3x + y = 19$ $2x - 5y = -10$
26. $8x + 3y = 26$ $2x = y - 4$	27. $2x + 3y = 71$ $2y = x - 4$	28. $x = y$ $y = 8 + 3x$

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Solve each system of equations by the elimination method  
(addition/subtraction):

<p><b>Example:</b> <math>3x - 2y = 4</math> (1) <math>2x - 5y = -1</math> (2)</p> <p>Multiply equation (1) by 2 And multiply equation (2) by -3</p> $2(3x - 2y) = 2(4)$ $-3(2x - 5y) = -3(-1)$ $6x - 4y = 8$ $-6x + 15y = 3$ <p>Add these equations, &amp; solve <math>11y = 11; y = 1</math> Substitute <math>y = 1</math> into eqn (1) <math>3x - 2(1) = 4</math> <math>3x - 2 = 4</math> <math>3x = 6</math> <math>X = 2</math></p> <p><b>Solution is (2,1).</b></p>	<p>29. <math>5x - y = 20</math> <math>3x + y = 12</math></p>	<p>30. <math>3x - 2y = 11</math> <math>3x - y = 7</math></p>
<p>31. <math>5x + 2y = 19</math> <math>3x - 4y = 1</math></p>	<p>32. <math>3x - 2y = 1</math> <math>x - 2y = -21</math></p>	<p>33. <math>6x + 15y = 90</math> <math>3x - 7y = 16</math></p>

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**Quadratic Equations: Solve by setting to zero and factoring:**

<p>Example:</p> $3x^2 + 14x = -8$ $3x^2 + 14x + 8 = 0$ $(3x + 2)(x + 4) = 0$ $3x + 2 = 0 \quad \text{or} \quad x + 4 = 0$ $3x = -2 \quad \quad \quad x = -4$ $x = -\frac{2}{3}$ <p>Solutions: <math>-\frac{2}{3}</math> or <math>-4</math></p>	34. $x^2 - 5x + 6 = 0$	35. $x^2 - 144 = 25$
36. $x^2 + 25 = 10x$	37. $x^2 + 8x = 0$	38. $x(x + 5) = 14$
39. $50x^2 = 200$	40. $(x - 5)^2 = 16$	41. $x^2 = 20 - 36$
42. $6x^2 = 5x + 6$	43. $x^2 - 400 = 0$	44. $x^2 - 7x = 18$

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Simplify these fractions: reduce by common factors.

Example: $\frac{x+6}{36-x^2}$ $= \frac{(x+6)}{(6-x)(6+x)}$ $= \frac{1}{6-x}$	45. $\frac{14}{70}$	46. $\frac{18x}{27}$
47. $\frac{5bc}{15b^2}$	48. $\frac{-18r^3t}{12rt}$	49. $\frac{x^2-25}{x^2-12x+35}$
50. $\frac{9x-6y}{3}$	51. $\frac{33xy-22y}{11y}$	52. $\frac{3x^2-6x-24}{3x^2+2x-8}$
53. $\frac{x^2-y^2}{x-y}$	54. $\frac{36a^4b^6c^2}{27ab^2c}$	55. $\frac{125rs^2t}{10r^2st^4}$

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Simplify these radical as much as possible, without a calculator:

Example: $\sqrt{24} = \sqrt{4} \sqrt{6} = 2\sqrt{6}$	Example: $\sqrt{\frac{4}{5}} = \frac{\sqrt{4}}{\sqrt{5}} = \frac{2}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$ $= \frac{2\sqrt{5}}{\sqrt{25}} = \frac{2\sqrt{5}}{5}$	Example: $(2\sqrt{3})^2 = (2\sqrt{3})(2\sqrt{3})$ $= (2)(2)\sqrt{3}\sqrt{3}$ $= 4\sqrt{9} = (4)(3) = 12$
56. $\sqrt{81}$	57. $\sqrt{400}$	58. $\sqrt{2} \sqrt{18}$
59. $\sqrt{5} \sqrt{30}$	60. $4\sqrt{18}$	61. $\sqrt{98}$
62. $(9\sqrt{2})^2$	63. $\sqrt{6\frac{1}{4}}$	64. $5\sqrt{27}$
65. $3\sqrt{8}$	66. $\sqrt{144}$	67. $\sqrt{64}$
68. $\sqrt{125}$	69. $\sqrt{24} \sqrt{3}$	70. $(\sqrt{4})^3$

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**Simplify these exponential expressions.**  
**Any exponents that remain in the answer should be positive.**

SAMPLES: $x^0 = 1$ $x^2x^3 = x^{(2+3)} = x^5$ $\frac{x^7}{x^3} = x^{(7-3)} = x^4$ $(x^3)^2 = x^{(3)(2)} = x^6$	SAMPLES: $x^{-2} = \frac{1}{x^2}$ $(-5)^2 = (-5)(-5) = 25$ $-5^2 = -(5)(5) = -25$ $(-5)^{-2} = \frac{1}{(-5)^2} = \frac{1}{25}$	71. $3^{-2}$
72. $17^0$	73. $4^23^32^{-2} =$	74. $5^25^35^{-4}$
75. $(-1)^7$	76. $(-2xyw^5)(-5x^2y^3w^{-3})$	77. $(-1)^82x^0$
78. $(cd^4)^3$	79. $(e^2)^{-2}$	80. $\frac{x^3}{x^5}$

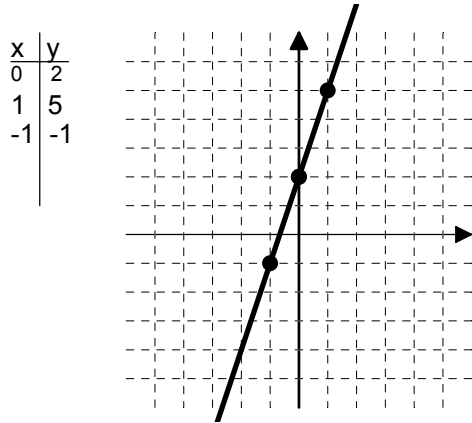
**Evaluate each expression.**  
**Substitute the known values for the indicated variables:**

Example: Evaluate LW when L = 4, W = 3.2 Answer: LW = (4)(3.2) = 12.8	Example: Evaluate $x^2y + z$ when $X = 3, y = -2, z = 5$ $x^2y + z = 3^2(-2) + 5 = -13$	81. $\frac{x+5}{y-2}$ when $x=-2, y=-4$
82. MX + B when $M = \frac{1}{3}, x = -6, B = 4$	83. $\frac{1}{2}(a + B)c$ When a = 12, B = 6, c = 4	84. $\frac{4}{3}(3.14)r^3$ When r = 3

**Draw the graph for each equation:**

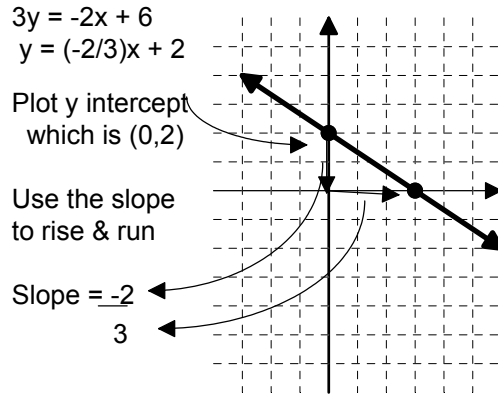
**Example:**

$$y = 3x + 2$$

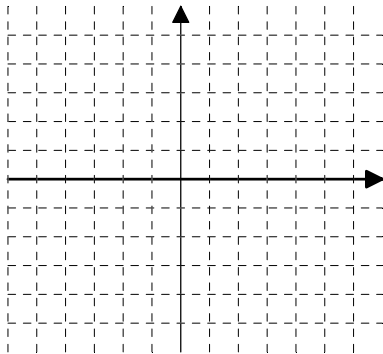


**Example:**

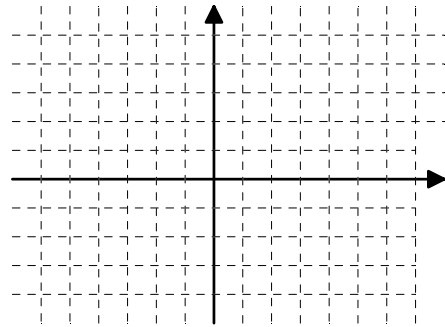
$$2x + 3y = 6$$



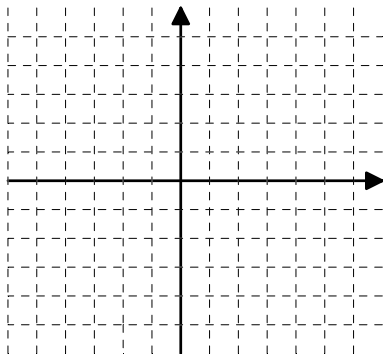
85.  $y = 2x - 3$



86.  $-2x + y = 5$



87.  $y = -3x + 4$



88.  $3x - 2y = 8$

