

Name: _____

Concepts and Vocabulary:

8. Name three methods for solving a linear equation.

9. If a graphical solution to a linear equation results in the point of intersection (3,4), then the solution to the equation is _____.

In exercises 13 - 16, classify each statement as true or false.

13. The equation $2x - 1 = 2x$ is a contradiction.

14. The equation $3(x - 5) = 3x - 15$ is an identity.

15. The equation $x + 7 = 9$ is an identity.

16. The equation $4x - 6 = x$ is a contradiction.

In exercises 17 and 21, decide whether the given value for the variable is a solution to the equation.

17. $x - 6 = -2$

$x = 5$

21. $-(2z - 3) + 2z = 1 - z$

$z = -2$

Supplemental:

S1. What is the definition of a solution to an equation?

Symbolic Solutions:

In exercises 23 - 65 odd, solve the equation symbolically. Check your solutions to problems 37, 45, 57, 61.

$$27. \frac{1}{2} - x = 2$$

$$39. 3x - 1 = 11(1 - x)$$

$$31. -\frac{1}{3}x = 4$$

$$41. x + 4 = 2 - \frac{1}{3}x$$

$$37. 2x = 8 - \frac{1}{2}x$$

$$45. \frac{2x + 1}{3} = \frac{2x - 1}{2}$$

Check:

Check:

$$49. \frac{1}{2}x - \frac{3}{2} = 4$$

$$59. \frac{3k}{4} - \frac{2k}{3} = \frac{1}{6}$$

$$57. \frac{2}{3}(t - 3) + \frac{1}{2}t = 5$$

$$61. 0.2(n - 2) + 0.4n = 0.05$$

Check:

Check:

Numerical Solutions:

In exercises 67 and 69, complete the table. Then use the table to solve the equation. State your solution using a complete sentence and set notation.

$$67. -4x + 8 = 0$$

| | | | | |
|-----------|---|---|---|---|
| x | 1 | 2 | 3 | 4 |
| $-4x + 8$ | 4 | | | |

$$69. 4 - 2x = x + 7$$

| | | | | | |
|----------|----|----|---|---|---|
| x | -2 | -1 | 0 | 1 | 2 |
| $4 - 2x$ | 8 | | | | |
| $x + 7$ | 5 | | | | |

In exercises 73 and 75, solve the linear equation numerically. Set up the table yourself and state a conclusion using a complete sentence and using set notation.

71. $x - 3 = 7$

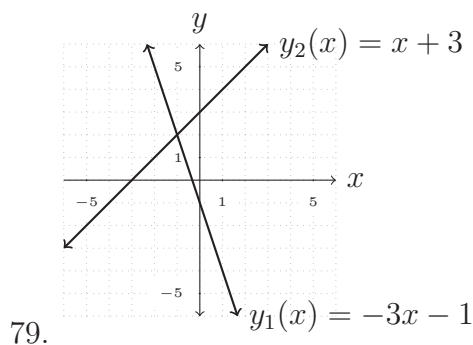
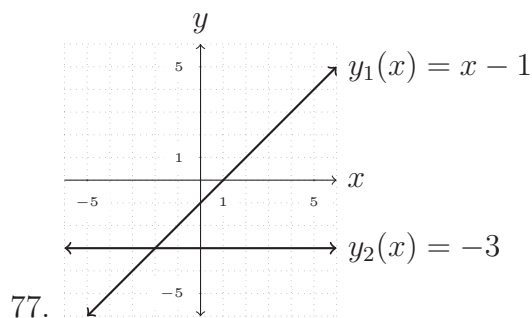
75. Use your calculator's table features to solve numerically. Please show your table in the provided space.

$$3(z - 1) + 1.5 = 2z$$

73. $2t - \frac{1}{2} = \frac{3}{2}$

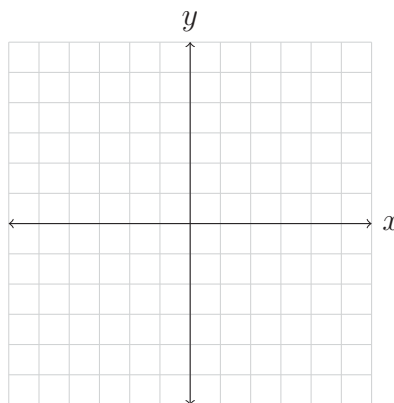
Graphical Solutions:

In exercises 77 and 79, a linear equation is solved graphically by letting y_1 equal the left side of the equation and y_2 equal the right side of the equation. State the linear equation the graphical solution is depicting and then state the solution to the equation using a complete sentence and set notation. Check your solution in the linear equation you determined.

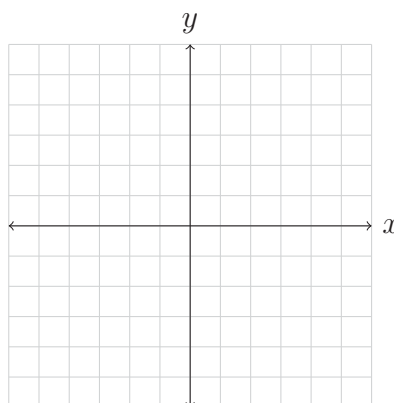


In exercises 81 - 89 odd, solve the equations graphically. State the functions $y_1(x)$ and $y_2(x)$ which you are graphing to determine the solution to the equation. For the calculator problems, 87 and 89, you do not need to draw the graph.

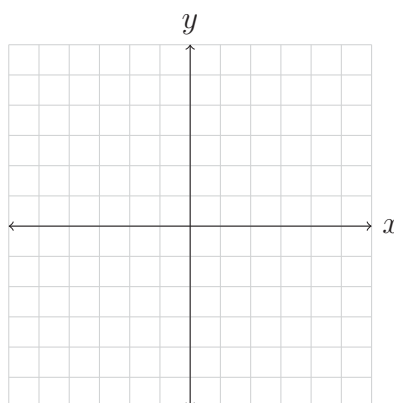
81. $5 - 2x = 7$



83. $2x - (x + 2) = -2$



85. $3(x + 2) + 1 = x + 1$



In problems 87 and 89, use your calculator to solve the equations graphically. You do not need to draw the graph.

87. $5(x - 1990) + 15 = 100$

89. $\sqrt{2} + 4(x - \pi) = \frac{1}{7}x$

Solving Linear Equations By More Than One Method:

In exercises 91, 92, and 93 solve the equation numerically, graphically, and symbolically.

91. $2x - 1 = 13$

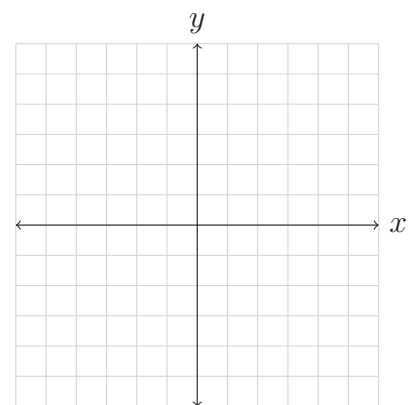
a. Numerically:

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b. Symbolically:

$$2x - 1 = 13$$

c. Graphically:



92. $9 - x = 3x + 1$

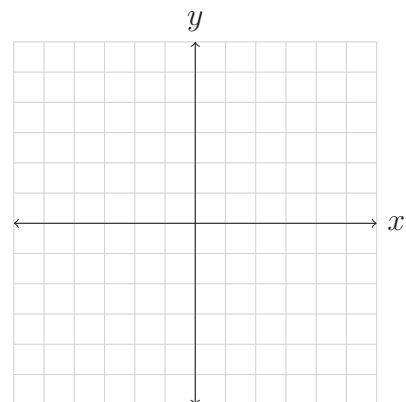
a. Numerically:

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b. Symbolically:

$$9 - x = 3x + 1$$

c. Graphically:



93. $3x - 5 - (x + 1) = 0$

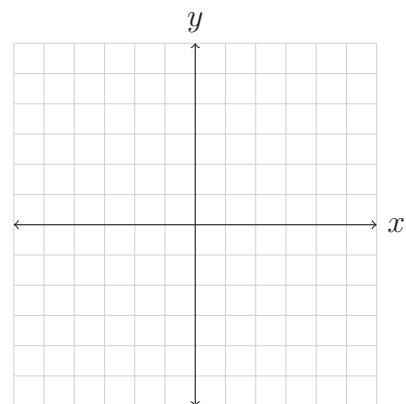
a. Numerically:

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b. Symbolically:

$$3x - 5 - (x + 1) = 0$$

c. Graphically:



Identities and Contradictions:

In exercises 95 - 101 odd, determine the set of solutions to the given equations. State your conclusion using a complete sentence and set notation.

95. $2x + 3 = 2x$

99. $2(x - 1) = 2x - 2$

97. $2x + 3x = 5x$

101. $5 - 7(4 - 3x) = x - 4(2 - 4x)$

Applications:

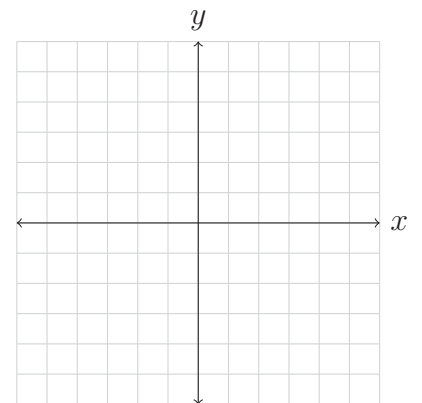
119. From 1995 to 2009 the number of state and federal prison inmates in millions can be modeled by $f(x) = 0.0338x - 66.5$ during year x . Determine numerically, symbolically, and graphically when there were 1.3 million inmates.

a. Numerically:

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b. Symbolically:

c. Graphically:



127. From 1985 to 1990, sales of CDs in the U.S. can be modeled by the equation $y_1 = 51.6(x - 1985) + 9.1$ and sales of LPs can be modeled by the equation $y_2 = -31.9(x - 1985) + 167.7$. All sales are in millions. Determine the year when sales of CDs and LPs were about equal.