



Technology

Graphing to Solve Equations

FOR USE WITH LESSON 2-4

You can use a graphing calculator to check solutions of equations. One way to do this is to graph each side of the equation. The x -coordinate of the point where the graphs intersect gives the solution of the equation.

EXAMPLE

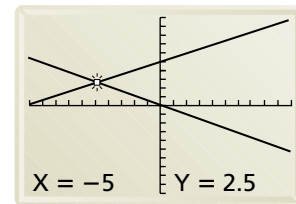
Solve $-\frac{1}{2}c = \frac{1}{2}c + 5$ using a graphing calculator.

Step 1 Press $\boxed{Y=}$ to go to the equation screen. Delete any equation(s) that may appear on this screen by using the $\boxed{\text{CLEAR}}$ and down arrow keys. Then for $Y_1 =$, enter $-\frac{1}{2}x$ by pressing $\boxed{(-)} \boxed{1} \boxed{/} \boxed{2} \boxed{)} \boxed{X,T,\theta}$. For Y_2 , enter $\frac{1}{2}x + 5$ by pressing $\boxed{(} \boxed{1} \boxed{/} \boxed{2} \boxed{)} \boxed{X,T,\theta} \boxed{+} \boxed{5}$.

Step 2 Graph the equations. Use a standard graphing window, which you can find using the $\boxed{\text{ZOOM}}$ feature.

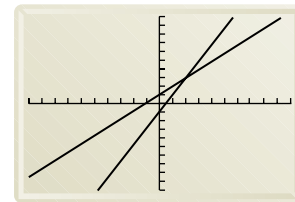
Step 3 Find the point where the graphs intersect. First press $\boxed{2nd} \boxed{\text{CALC}}$ 5. Move the cursor near the point of intersection. Press $\boxed{\text{ENTER}}$ three times to find the coordinates of the intersection point.

The x -coordinate of the point is the solution of the equation. The solution of $-\frac{1}{2}c = \frac{1}{2}c + 5$ is -5 .



EXERCISES

- The graphing calculator screen at the right shows the solution of $2w - 1 = w + 1$.
 - What two equations were graphed?
 - What is the x -coordinate of the point where the graphs intersect?
 - What is the solution of the equation?
- David solved $3(a + 1) = 5a + 4$. His solution was $-\frac{3}{2}$. Graph $y = 3(x + 1)$ and $y = 5x + 4$. Use the $\boxed{\text{CALC}}$ feature to find the x -coordinate of the intersection of the two lines. Is David's solution correct? If not, what is the correct solution?



Use your graphing calculator to solve each equation.

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|----------------------|---------------------|--|
| 3. $2a + 5 = -a - 4$ | 4. $4b - 10 = 2b$ | 5. $-5.4(2n + 5) = 1.8(6 + 3n)$ |
| 6. $3p - 8 = -6 + p$ | 7. $4 - 7n = n + 4$ | 8. $5x - \frac{1}{2} = 4x + \frac{3}{4}$ |

Use your graphing calculator to check each solution. If the solution is incorrect, state the correct solution.

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|------------------------------------|--|---------------------------------------|
| 9. $5(q + 1) = q + 2; \frac{1}{4}$ | 10. $2h - 9 = -3(h - 6); 5\frac{2}{5}$ | 11. $b - 0 = -2(b + 1); 3\frac{2}{3}$ |
| 12. $6(2n - 5) = -3(7 - 3n); 3$ | 13. $8x + 5 = -(2x + 8) - 2; -2.5$ | |