Graphing Calculator and Pencil-and-Paper Techniques

Instructions: For the following systems of equations, first graph each equation in your calculator. Then estimate the coordinates of the intersection(s), if any, and record your estimates in the table before. Finally, use an appropriate method to solve the system algebraically (“paper-and-pencil”) and show your work.

Instructions for the graphing calculator: On the “Y=” screen, type the two equations in Y1 and Y2 and press “Graph.” Adjust your window dimensions as need be.

1. *y* = *x*2 – 8*x* + 16 and *y* = 9
2. *y* = 3*x*2 + 2*x* – 4 and *y* = -2*x* + 5
3. y = *x*2 + 2*x* + 7 and *y* = 6
4. y = -2x2 + 8x – 1 and y = (1/2)x + 7

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| --- | --- | --- | --- | --- |
| Problem | Estimated Number of Solutions | Estimated Coordinates | Paper-and-Pencil Number of Solutions | Paper-and-Pencil Solution(s) |
| A |  |  | 2 | x = 1, y = 9  x = 7, y = 9 |
| B |  |  | 2 | x -2.52, y 10.045  x 1.19, y 2.62 |
| C |  |  | 1 | x = -1, y = 6 |
| D |  |  | 0 | No solution |

Were any of your estimates off by a significant amount? Why do you think that is so?

Describe the connection between the points of intersection on the graph and the solution(s) to the equation. Make a conjecture.