

Section 13-5: Algebraic Solution of a Quadratic-Linear System

1. 060018a, P.I. A.A.11

The graphs of the equations $y = x^2 + 4x - 1$ and $y + 3 = x$ are drawn on the same set of axes. At which point do the graphs intersect?

- [A] (1, -2) [B] (1, 4)
[C] (-2, 1) [D] (-2, -5)

2. 080135a, P.I. A.A.11

Solve the following system of equations algebraically:

$$y = x^2 + 4x - 2$$
$$y = 2x + 1$$

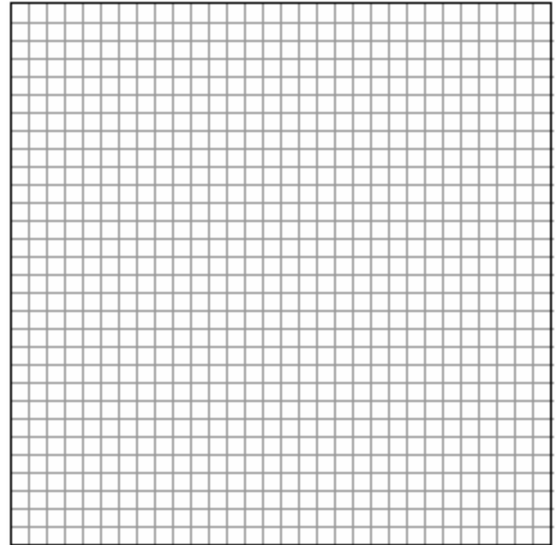
3. 080538a, P.I. A.A.11

Solve the following system of equations:

$$y = x^2 + 4x + 1$$

$$y = 5x + 3$$

[The use of the grid is optional.]

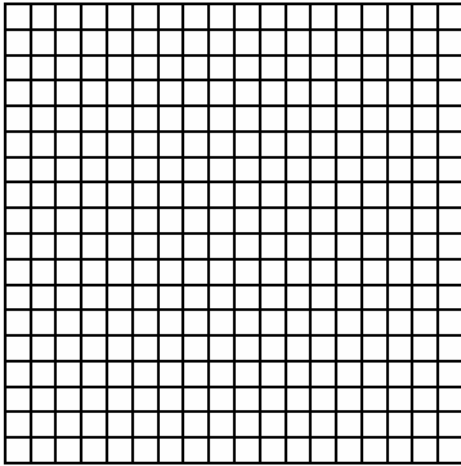


4. 069935a, P.I. A.A.11

Solve the following system of equations algebraically or graphically for x and y :

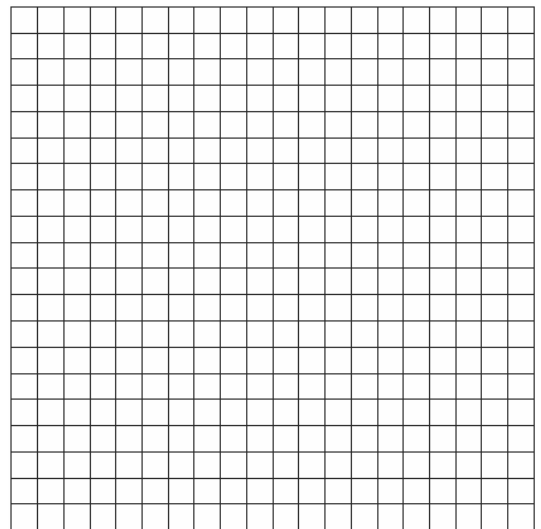
$$y = x^2 + 2x - 1$$

$$y = 3x + 5$$



5. 060228b, P.I. A.A.11

A pelican flying in the air over water drops a crab from a height of 30 feet. The distance the crab is from the water as it falls can be represented by the function $h(t) = -16t^2 + 30$, where t is time, in seconds. To catch the crab as it falls, a gull flies along a path represented by the function $g(t) = -8t + 15$. Can the gull catch the crab before the crab hits the water? Justify your answer. [The use of the accompanying grid is optional.]



[1] D

[4] $(-3,-5)$ and $(1,3)$, and appropriate algebraic work is shown.

[3] Appropriate algebraic work is shown, but $x = -3$ and $x = 1$ are given as the solution.

or [3] Appropriate algebraic work is shown, but only one correct solution is given, such as $(1,3)$.

[2] $(-3,-5)$ and $(1,3)$, but a graphic solution is shown.

or [2] Correct substitution and an algebraic equation set equal to zero are shown, but the result is not factored, such as $x^2 + 2x - 3 = 0$.

[1] Any correct substitution is shown, such as $2x + 1 = x^2 + 3x - 2$.

or [1] $(-3,-5)$ and $(1,3)$, but no algebraic work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[2] incorrect procedure.

[4] $(-1,-2)$ and $(2,13)$, and appropriate work is shown, such as an algebraic or graphic solution or trial and error with at least three trials and appropriate checks.

[3] Appropriate work is shown, but one computational or graphing error is made.

or [3] Appropriate work is shown, but only one solution is found or only the x - or the y -values are found.

[2] Appropriate work is shown, but two or more computational or graphing errors are made.

or [2] Appropriate work is shown, but one conceptual error is made.

or [2] The trial-and-error method is used to find the correct solutions, but only two trials and appropriate checks are shown.

or [2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.

or [2] Both equations are graphed correctly, but neither ordered pair is identified.

or [2] Only one equation is graphed correctly, but an appropriate solution is found.

or [2] An incorrect quadratic equation of equal difficulty is solved appropriately, and appropriate solutions are found.

[1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made.

or [1] One equation is graphed correctly, but no further correct work is shown.

or [1] An incorrect equation of a lesser degree of difficulty, such as a linear equation, is solved appropriately.

or [1] A correct substitution is made and the system of equations is simplified to a single quadratic equation set equal to zero, but no further correct work is shown.

or [1] $(-1,-2)$ and $(2,13)$, but no work or only one trial with an appropriate check is shown.

[0] $(-1,-2)$ or $(2,13)$, but no work or only one trial with an appropriate check is shown.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[3] obviously incorrect procedure.

[4] (3,14) and $(-2,-1)$ and either an algebraic or a graphic solution is shown.

[3] An appropriate method is shown, but only one correct ordered pair is identified.

or [3] An appropriate method is shown, but one computational mistake is made.

or [3] An appropriate method is shown, but values are given only for x .

[2] The substitution is correct, but the quadratic produced is not factored correctly.

or [2] Both equations are graphed correctly, but neither ordered pair is identified.

[1] Only one equation is graphed correctly.

or [1] The substitution is incorrect, but it produces a linear equation that is solved correctly.

or [1] Only the substitution is correct.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[4] incorrect procedure.

[4] Yes, and appropriate work is shown, and an appropriate justification is given.

[3] Appropriate work is shown, and an appropriate justification is given, but one computational error is made, or the negative value of t is not rejected.

[2] An appropriate graph or equation is shown, such as $16t^2 - 8t - 15 = 0$.

[1] An incorrect graph or equation of equal difficulty is used, but an appropriate solution is found.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[5] incorrect procedure.
