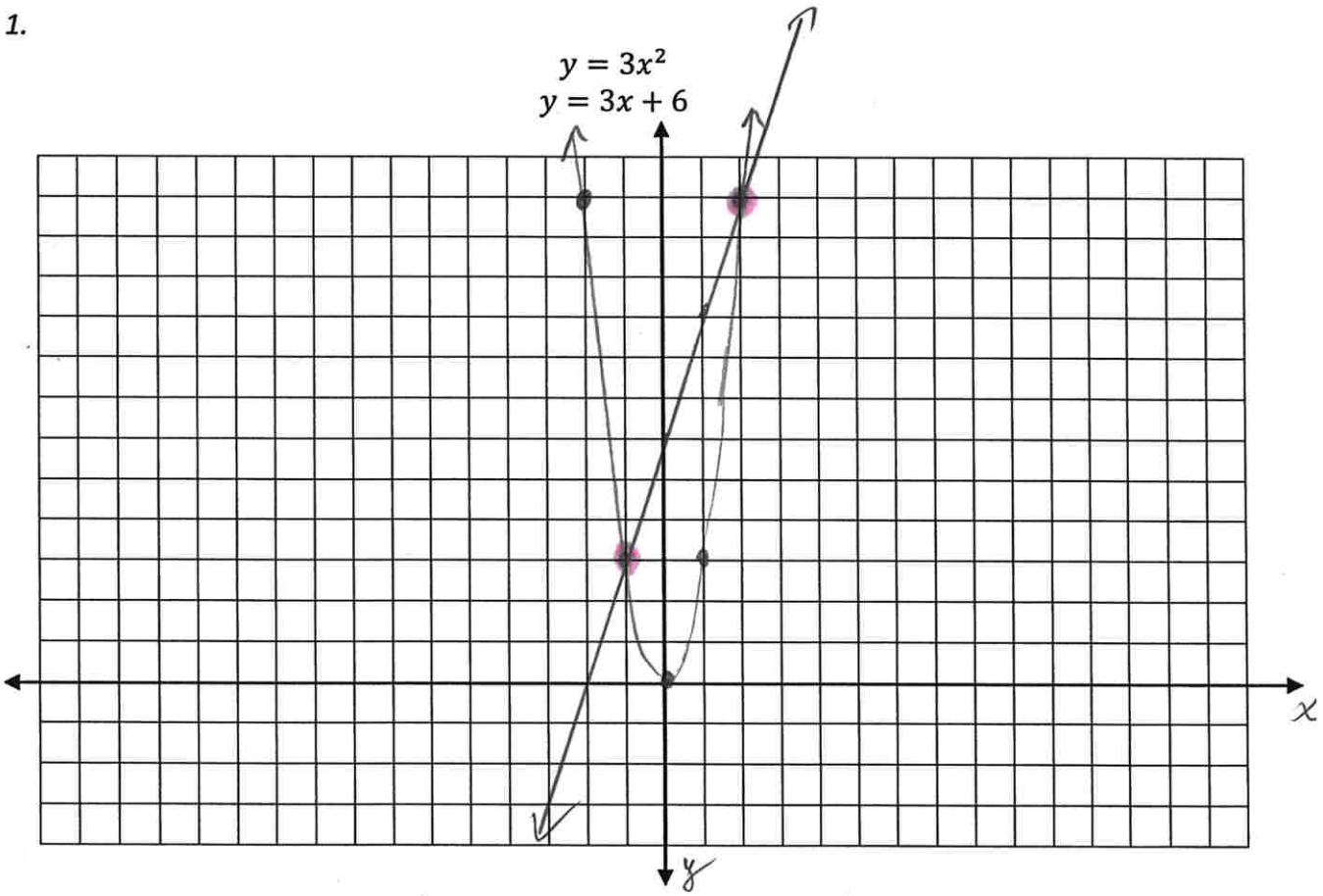
KEY

PC11

Quadratic-Linear Systems of Equations
Solving by Graphing

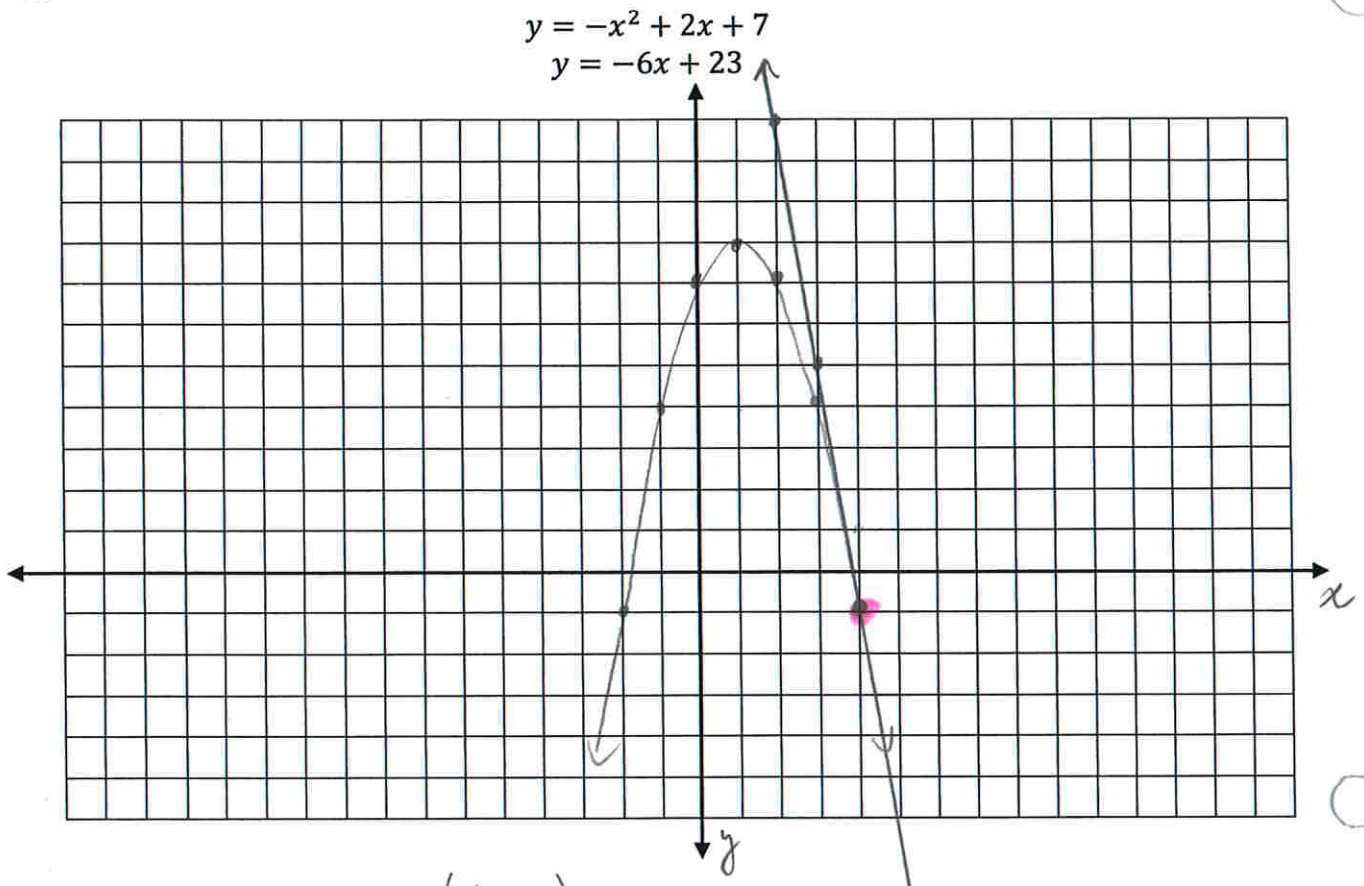
Solve the given system by graphing. Clearly state the solution(s) if it exists.

1.



∴ The solution(s) ~~is~~ (are) (-1, 3) and (2, 12).

2.



∴ The solution(s) is (are) $(4, -1)$.

$y = -6x + 23$

x	y
4	-1
3	5
2	11

$y = -[x^2 - 2x] + 7$

$y = -[x^2 - 2x + 1 - 1] + 7$

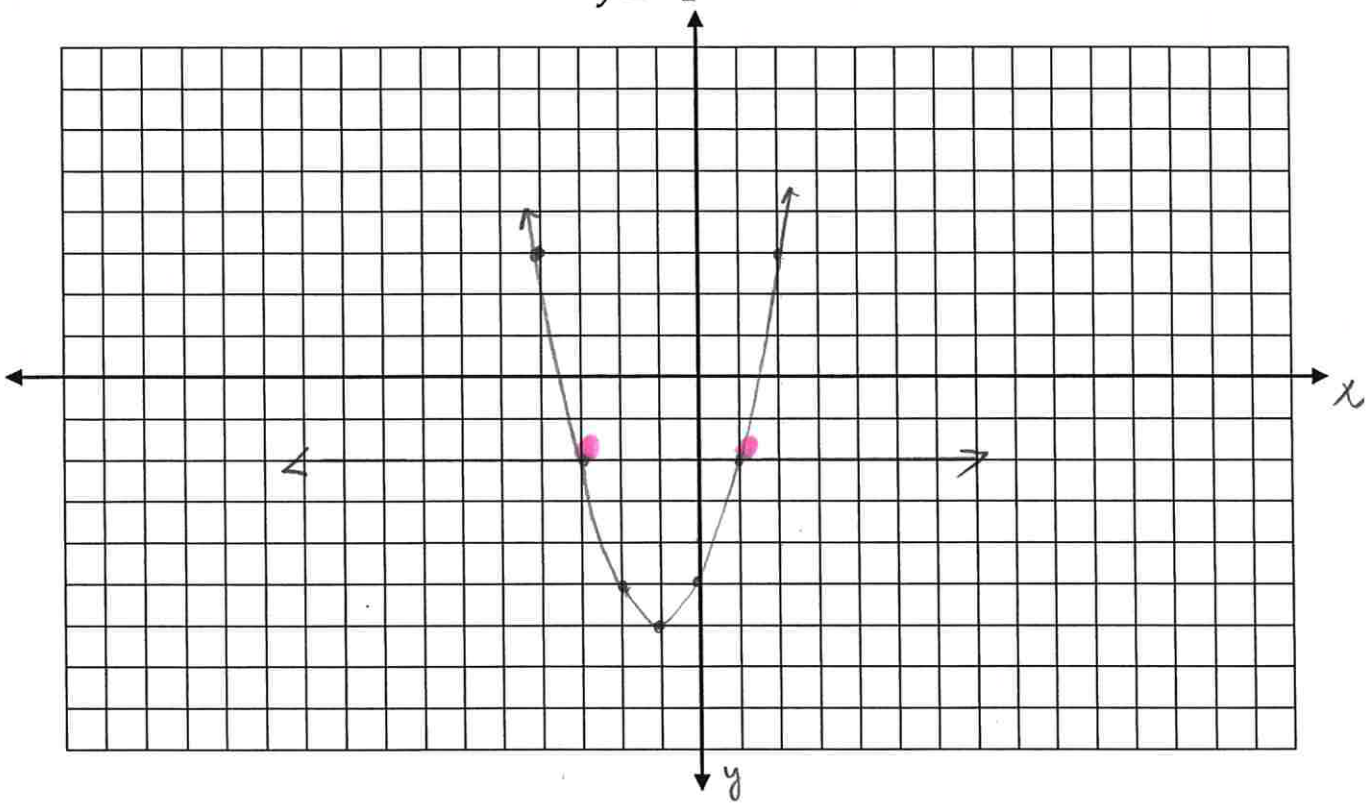
$y = -[(x-1)^2 - 1] + 7$

$y = -(x-1)^2 + 8$

3.

$y = (x+1)^2 - 6$

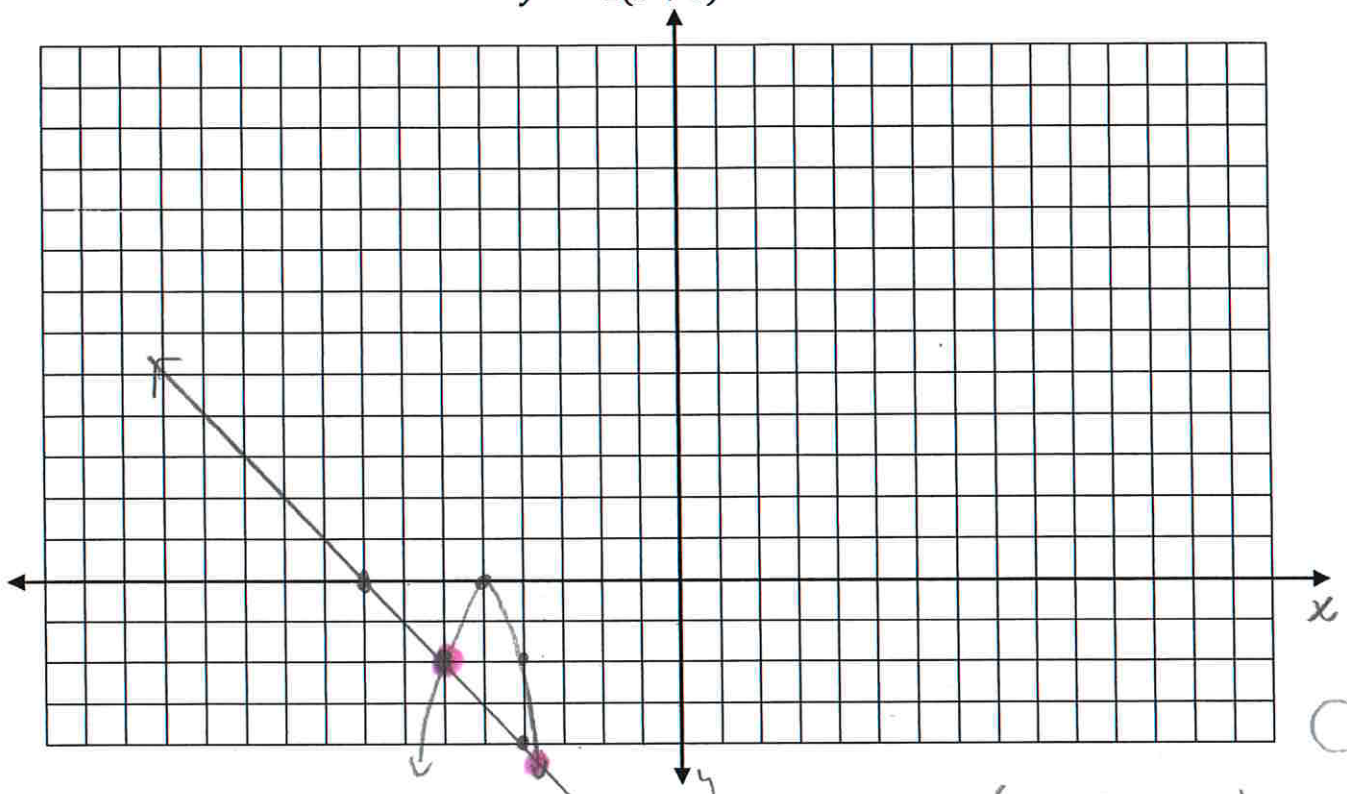
$y = -2$



∴ The solution(s) is (are) (−3, −2) and (1, −2).

4.

$y + 3 = -(x + 5)$
$y = -2(x + 5)^2$



∴ The solution(s) is (are) $(-6, -2)$ and $\approx (-3.5, -4.5)$

↑ an estimate

$y + 3 = -(x + 5)$

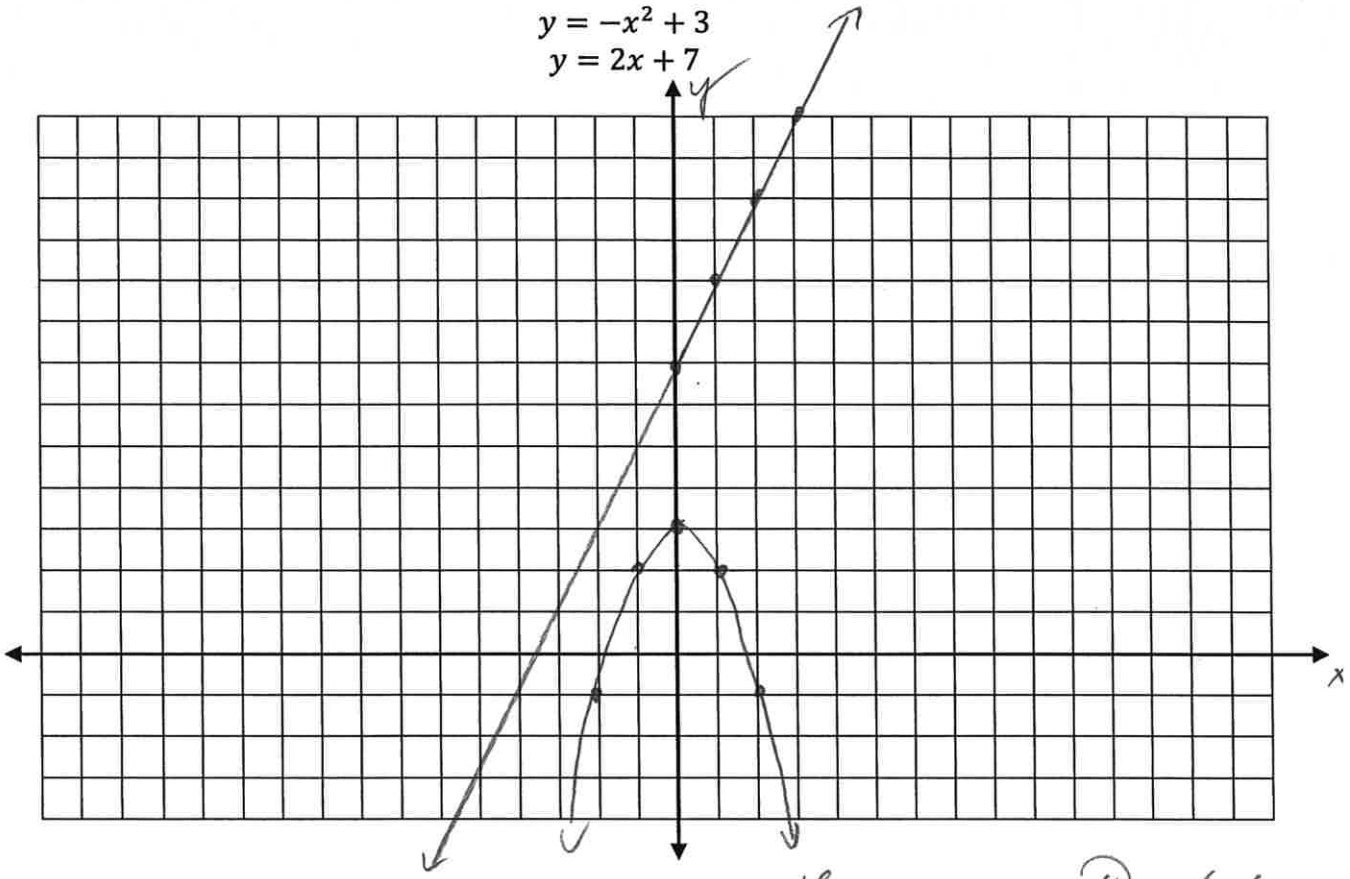
$y = -x - 5 - 3$

$y = -x - 8$

$y = \frac{-1}{1}x - 8$

x	y
-4	-4
-6	-2
-8	0

5.



∴ The solution(s) ~~is (are)~~ none ⇒ ∴ there is no ℝ solution.

Check that there is never a point of intersection:

solve: $-x^2+3 = 2x+7$

$0 = x^2+2x+4$

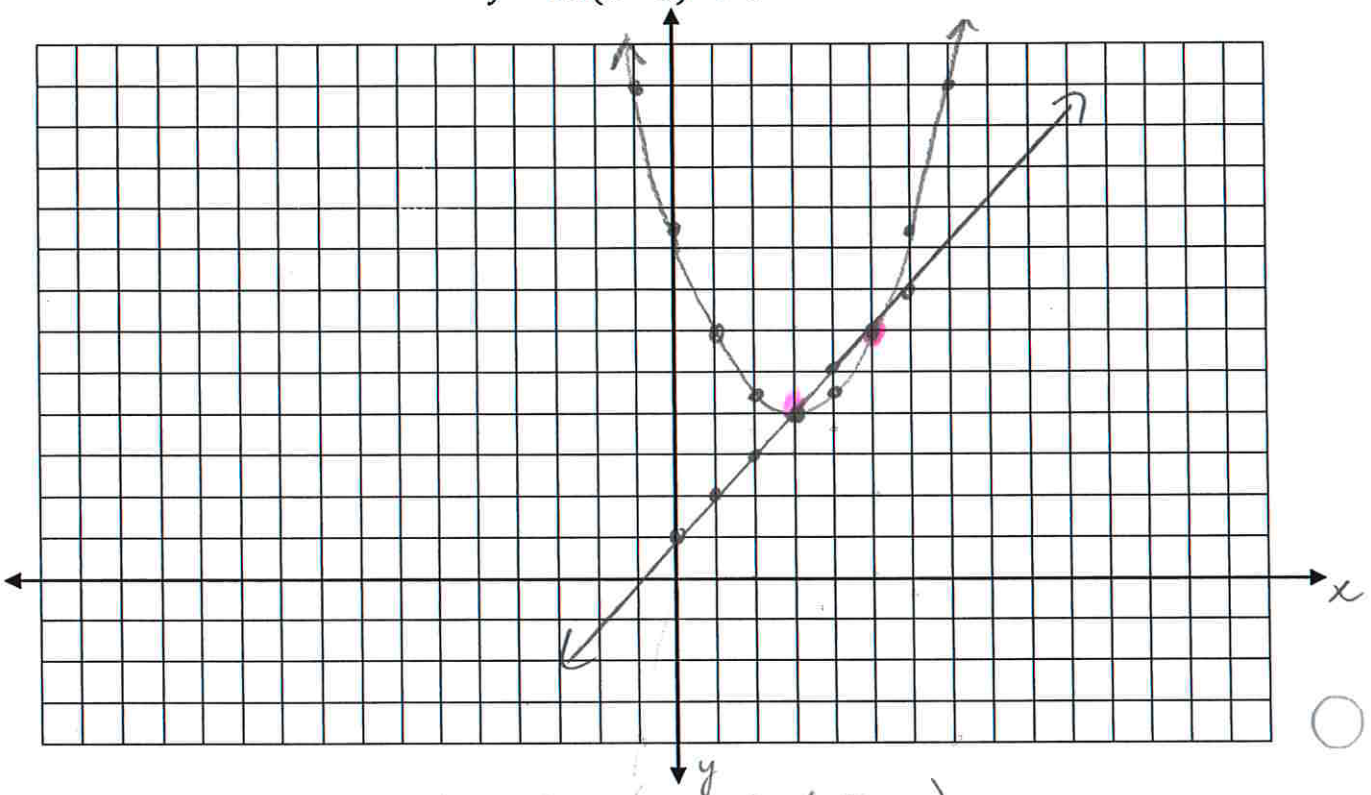
$$x = \frac{-2 \pm \sqrt{2^2-4(1)(4)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-12}}{2} \qquad D<0 \Rightarrow \text{no } \mathbb{R} \text{ solution}$$

6.

$x - y + 1 = 0$

$y = 0.5(x - 3)^2 + 4$



∴ The solution(s) is (are) (3, 4) and (5, 6).

$x - y + 1 = 0$

$-y = -x - 1$

$y = x + 1$

$y = \frac{1}{1}x + 1$