2. $\begin{cases} 2x+y=7 \\ 3x-y=13 \end{cases}$ Solving the first equation for y, we get $y=7-2x$ and substituting this into the second equation, gives $2x+(7-2x)=13 \quad\Leftrightarrow\quad 5x=20 \quad\Leftrightarrow\quad x=4$. Substituting for x we get $y=7-2x=7-2(4)=-1$. Thus the solution is $(4,-1)$.

4. $\begin{cases} x^2+y^2=25 \\ y=\frac{3}{4}x \end{cases}$ Substituting for y in the first equation gives $x^2+\left(\frac{3}{4}x\right)^2=25 \quad\Leftrightarrow\quad \frac{25}{16}x^2=25$ $\Leftrightarrow\quad x^2=16 \quad\Rightarrow\quad x=\pm4$. When $x=4$ then $y=\frac{3}{4}(4)=3$, and when $x=-4$ then $y=\frac{3}{4}(-4)=-3$. Thus the solutions are $(4,3)$ and $(-4,-3)$.

6. $\begin{cases} x^2+y=9 \\ x-y+3=0 \end{cases}$ Solving the first equation for y, we get $y=9-x^2$. Substituting this into the second equation gives $x-(9-x^2)+3=0 \quad\Leftrightarrow\quad x^2+x-6=0 \quad\Leftrightarrow\quad (x+3)(x-2)=0$ $\Leftrightarrow\quad x=-3$ or $x=2$. If $x=-3$, then $y=9-(-3)^2=0$, and if $x=2$, then $y=9-(2)^2=5$. Thus the solutions are $(-3,0)$ and $(2,5)$.

8. $\begin{cases} 4x-3y=10 \\ 9x+4y=1 \end{cases}$ Multiplying the first equation by 4 and the second by 3 gives the system

$\begin{cases} 16x-12y=40 \\ 27x+12y=3 \end{cases}$. Adding, we get $43x=43 \quad\Leftrightarrow\quad x=1$. Substituting this value into the second equation gives $9(1)+4y=1 \quad\Leftrightarrow\quad 4y=-8 \quad\Leftrightarrow\quad y=-2$. Thus the solution is $(1,-2)$.

10. $\begin{cases} 3x^2+4y=17 \\ 2x^2+5y=2 \end{cases}$ Multiplying the first equation by 2 and the second by 3 gives the system

$\begin{cases} 6x^2+8y=34 \\ -6x^2-15y=-6 \end{cases}$. Adding we get $-7y=28 \quad\Rightarrow\quad y=-4$. Substituting this value into the second equation gives $2x^2+5(-4)=2 \quad\Rightarrow\quad 2x^2=22 \quad\Leftrightarrow\quad x^2=11 \quad\Leftrightarrow\quad x=\pm\sqrt{11}$. Thus the solutions are $(\sqrt{11},-4)$ and $(-\sqrt{11},-4)$.

12. $\begin{cases} 2x^2+4y=13 \\ x^2-y^2=\frac{7}{2} \end{cases}$ Multiplying the second by 2 gives the system $\begin{cases} 2x^2+4y=13 \\ 2x^2-2y^2=7 \end{cases}$. Subtracting the equations gives $4y+2y^2=6 \quad\Leftrightarrow\quad y^2+2y-3=0 \quad\Leftrightarrow\quad (y+3)(y-1)=0 \quad\Leftrightarrow$ $y=-3, y=1$. If $y=-3$, then $2x^2+4(-3)=13 \quad\Leftrightarrow\quad x^2=\frac{25}{2} \quad\Leftrightarrow\quad x=\pm\frac{5\sqrt{2}}{2}$. If $y=1$, then $2x^2+4(1)=13 \quad\Leftrightarrow\quad x^2=\frac{9}{2} \quad\Leftrightarrow\quad x=\pm\frac{3\sqrt{2}}{2}$. Hence, the solutions are $\left(\pm\frac{5\sqrt{2}}{2},-3\right)$ and $\left(\pm\frac{3\sqrt{2}}{2},1\right)$.

14. $\begin{cases} x-y^2=0 \\ y-x^2=0 \end{cases}$ Solving the first equation for x and the second equation for y gives $\begin{cases} x=y^2 \\ y=x^2 \end{cases}$. Substituting for y in the first equation gives $x=x^4 \quad\Leftrightarrow\quad x(x^3-1)=0 \quad\Leftrightarrow\quad x=0, x=1$. Thus, the solutions are $(0,0)$ and $(1,1)$.