1. (6 points) Solve by elimination method:

\[
\begin{align*}
\begin{cases}
   x^2 - y^2 &= -25 \\
   x^2 + y^2 &= 225
\end{cases}
\end{align*}
\]

2. (5 points) Divide: \( \frac{-5i}{2 - i} \)
3. (5 points) Simplify: $i^{85} - i^{100}$

4. (6 points) Graph $(x + 3)^2 + (y - 2)^2 = 16$, and give its domain and range in interval notation.

5. (6 points) Solve and check: $\sqrt{x - 3} + \sqrt{x} = 3$
6. (8 points) Graph \(\frac{x^2}{9} - \frac{(y + 2)^2}{4} = 1\), and give its domain and range in interval notation.

7. (6 points) Rationalize the denominator: \(\frac{3\sqrt{7}}{\sqrt{7} - 2}\)

8. (5 points) Simplify, and write your answer using a single radical: \(\frac{\sqrt[3]{x^5}}{\sqrt[6]{x}}\)
9. (5 points) Graph \( \frac{(x + 2)^2}{9} + \frac{y^2}{25} = 1 \), and give its domain and range in interval notation.

10. (4 points) Simplify \( \sqrt{-16xy} + \sqrt{54xy} - \sqrt{2xy} \).

11. (4 points) Rationalize the denominator: \( \frac{-6x^2}{\sqrt{2x}} \).

12. (5 points) \( y \) varies directly as the square of \( x \). \( y \) is 100 when \( x \) is 2. Find \( y \) when \( x \) is \( \frac{1}{5} \).
13. (6 points) Solve by graphing and cramer’s rule:
\[
\begin{align*}
  x + y &= 4 \\
  x - y &= 6
\end{align*}
\]

14. (5 points) Solve: \(|2x - 7| = 3\)

15. (5 points) Find the domain of the function \(f(x) = \sqrt{8 - 2x}\), and give your answer in interval notation.
16. (5 points) Solve by matrix method.
\[
\begin{align*}
x + y &= 4 \\
3x - 4y &= -23
\end{align*}
\]

17. (4 points) Find \((f \cdot g)(x)\) for \(f(x) = \sqrt{x + 5} - \sqrt{5}\) and \(g(x) = \sqrt{x + 5} + \sqrt{5}\).

18. (5 points) The side opposite to the 30° angle in a right triangle is 10 feet. Find the measure of the other two sides.

19. (5 points) Find the value of the determinant:
\[
\begin{vmatrix}
\sqrt{6} & 3\sqrt{25} \\
\sqrt{5} & \sqrt{6}
\end{vmatrix}
\]