

Algebra 2 · Quadratic Equations with Complex Solutions · Test

Common Core N-CN.C.7, A-REI.B.4b · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This test has 8 questions worth 20 points in all. Allow 45 minutes. Show every step, write complex solutions in the form $a + bi$, and simplify radicals. A calculator is not needed. Partial credit is given for correct work.

Test information

- **Grade:** Algebra 2
- **Chapter:** Quadratic Equations with Complex Solutions
- **Common Core:** N-CN.C.7, A-REI.B.4b
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 2 pts; Question 4: 3 pts; Question 5: 3 pts; Question 6: 2 pts; Question 7: 3 pts; Question 8: 3 pts)

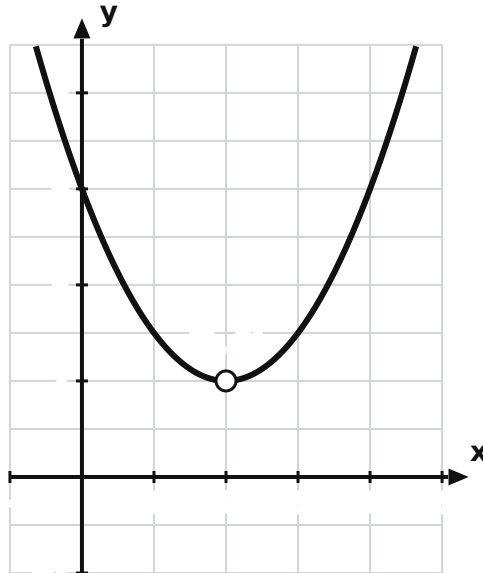
Question 1: Discriminant and solutions (2 points)

For each equation, find the discriminant and state the number and type of solutions.

- $x^2 - 4x + 7 = 0$ (1 point)
- $2x^2 + 5x - 3 = 0$ (1 point)

Question 2: Read a graph (2 points)

The graph of $y = x^2 - 4x + 6$ is shown.



The graph of $y = x^2 - 4x + 6$.

- How many real solutions does $x^2 - 4x + 6 = 0$ have? (1 point)
- Find the discriminant and describe the solutions. (1 point)

Question 3: Square root method (2 points)

Solve each equation.

- $4x^2 + 100 = 0$ (1 point)
- $(x+3)^2 = -16$ (1 point)

Question 4: Quadratic formula (3 points)

Solve $x^2 - 6x + 25 = 0$.

Question 5: Complete the square (3 points)

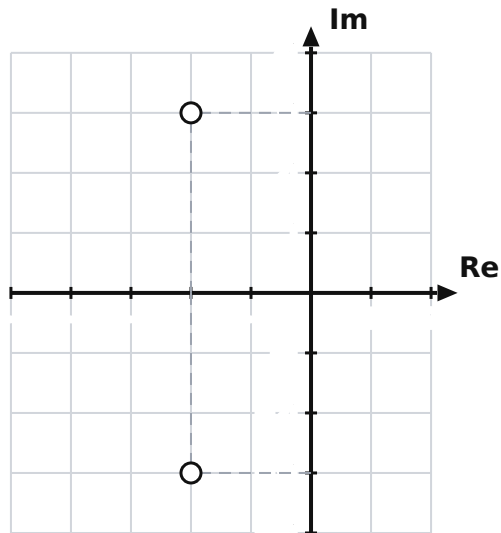
Solve $x^2 + 10x + 34 = 0$ by completing the square.

Question 6: A quadratic with fractions (2 points)

Solve $x^2 + x + 1 = 0$. (2 points)

Question 7: Solutions in the plane (3 points)

The points p and q are the two solutions of $x^2 + bx + c = 0$, where b and c are real.

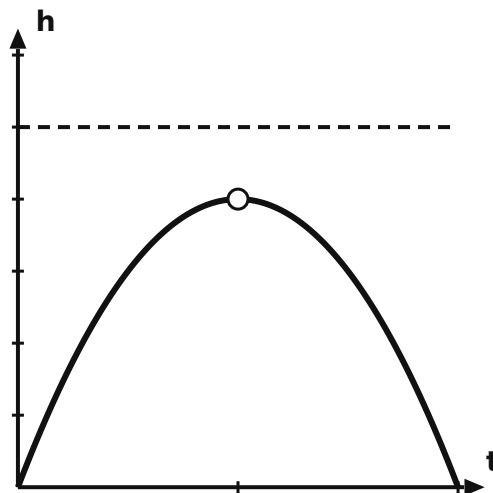


The two solutions of $x^2 + bx + c = 0$ plotted in the complex plane.

- Write p and q as complex numbers. (1 point)
- Find b . (1 point)
- Find c . (1 point)

Question 8: Will the balloon reach 20 feet? (3 points)

Sofia launches a water balloon. Its height in feet after t seconds is $h = -16t^2 + 32t$. Does the balloon ever reach a height of 20 ft? Solve an equation and explain.



Height h (feet) of a water balloon after t seconds.