

Algebra 2 · Radicals and Rational Exponents · Test

Common Core N-RN.A.1, N-RN.A.2, A-REI.A.2 · mathovore.fr

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

This test covers nth roots, rational exponents, simplifying radicals and solving radical equations, Common Core N-RN.A.1, N-RN.A.2 and A-REI.A.2. It has eight questions worth 20 points in total. A calculator is allowed for decimals only. Show all work for full credit.

Test information

- **Grade:** Algebra 2
- **Chapter:** Radicals and Rational Exponents
- **Common Core:** N-RN.A.1, N-RN.A.2, A-REI.A.2
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 2 pts; Question 4: 2 pts; Question 5: 2 pts; Question 6: 3 pts; Question 7: 3 pts; Question 8: 4 pts)

Question 1: Roots and powers (2 points)

Evaluate each expression without a calculator.

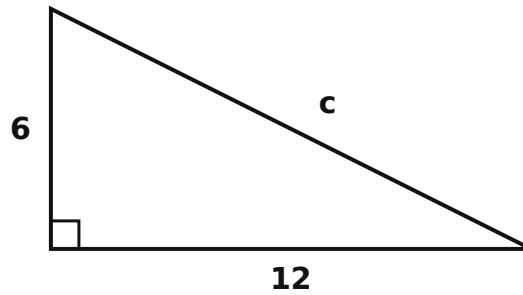
- $\sqrt[3]{-125}$ (1 point)
- $81^{3/4}$ (1 point)

Question 2: Radical and exponent forms (2 points)

- Write $x^{5/3}$ as a radical. (1 point)
- Write $\sqrt[4]{y^3}$ with a rational exponent. (1 point)

Question 3: Simplify radicals (2 points)

Simplify each answer.



Not drawn to scale.

- Find the exact length c of the hypotenuse of the triangle shown. (1 point)
- Simplify $\sqrt[3]{40x^4}$, where x is positive. (1 point)

Question 4: Combine radicals (2 points)

- Simplify $5\sqrt{12} - \sqrt{48} + \sqrt{75}$. (1 point)
- Rationalize the denominator of $\frac{12}{\sqrt{8}}$. (1 point)

Question 5: Exponent properties (2 points)

Simplify. Assume x and a are positive.

- $x^{2/3} \cdot x^{3/4}$ (1 point)
- $(16a^4)^{3/4}$ (1 point)

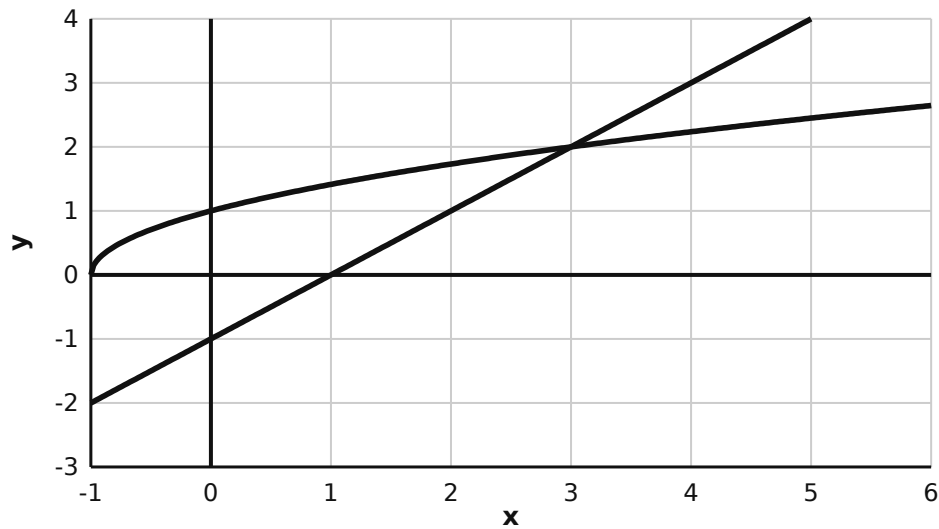
Question 6: Solve equations (3 points)

Solve each equation.

- $2\sqrt{3x-2} - 4 = 6$ (1 point)
- $x^{3/2} = 64$ (1 point)
- $\sqrt[3]{x+5} = -2$ (1 point)

Question 7: Extraneous solution (3 points)

The graphs of $y = \sqrt{x+1}$ and $y = x-1$ are shown.



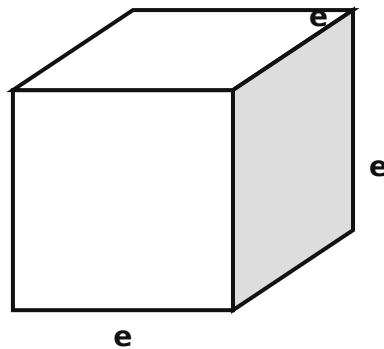
Graphs of $y = \sqrt{x+1}$ and $y = x-1$.

- Use the graph to estimate the solution of $\sqrt{x+1} = x-1$. (1 point)
- Solve the equation algebraically. (1 point)
- Check each candidate and name any extraneous solution. (1 point)

Question 8: Cube-shaped box (4 points)

A cube-shaped gift box has a volume of 192 cubic inches.

$$V = 192 \text{ cubic inches}$$



Not drawn to scale.

- Find the exact edge length in simplest radical form. (1 point)
- Round the edge length to the nearest hundredth. (1 point)
- Find the exact total surface area. (1 point)
- The box must fit a shelf 6 inches high. Does it fit? Explain. (1 point)