

Show all necessary steps Clearly, Neatly, and Systematically to receive full credit. Any incorrect statement will be penalized.

1. (6) Solve: $\sqrt{-k+2} + 2 = k$

2. (6) Simplify: $\left(w^{\frac{2}{3}}x^{-\frac{1}{2}}\right)^{-2} \left(2w^{-\frac{3}{4}}x^{-\frac{5}{8}}\right)^{-6}$

3. (6) Simplify:

a. $\frac{5}{4i}$

b. $(\sqrt{121} + \sqrt{-169})(\sqrt{225} - \sqrt{-289})$

4. (6) It takes one team 9 days less than another to survey 1000 people. If the teams work together, it takes them 20 days to complete such a survey. How long will it take each to do the survey alone?

5. (6) Simplify:

a. $x\sqrt[3]{-48x^4y^6} - x^2y\sqrt[3]{-162xy^3} + 7\sqrt[3]{6x^7y^6}$

b. $\sqrt[4]{\sqrt[6]{\sqrt[8]{x^{10}}}}$

6. (6) The intensity of light received from a light source varies inversely as the square of the distance from the light source. If a photographer, 16 feet away from his subject, has a light meter reading of 4 foot-candles of luminance, what will the meter read if the photographer moves in for a close-up 2 feet away from the subject. (*make sure define all the variables and set up formula*)

7. (6) Solve: $(a^2 + 6a)^{\frac{1}{4}} = 2(a - 1)^{\frac{1}{4}}$

8. (6) Solve: $(10 - \sqrt{t})^2 - 4(10 - \sqrt{t}) - 45 = 0$.

9. (6) Rationalize the denominator: $\frac{2\sqrt{x} - 3\sqrt{y}}{\sqrt{4x} + \sqrt{9y}}$

10. (6) Solve: $\sqrt{x+16} + \sqrt{x+9} = 7$

11. (6) Simplify: $\frac{\sqrt{36} - \sqrt{-49}}{\sqrt{64} + \sqrt{-81}}$

12. (6) In a scale drawing, a 280-foot antenna tower is drawn $7\frac{1}{2}$ inches high. The building next to it is drawn $2\frac{1}{4}$ inches high. How tall is the actual building?

13. (6) Solve by completing the square method: $4m^2 + 2m + 3 = 0$.

14. (6) Solve: $x^{\frac{2}{3}} + 6x^{\frac{1}{3}} = 16$

15. (3,4) Let the equation be $-x^2 = \frac{7x+1}{5}$.

a. Use the discriminant to determine the number and type of solutions.

b. Use the quadratic formula to solve the equation.

16. (6) Solve: $3(2-y)^2 + 7 = 32$