Radicals and rational exponents test

True/False

Indicate whether the statement is true or false.

_____ 1. The radical $\sqrt[3]{45^5}$ can be written in rational form as $45^{3/5}$.

Multiple Choice

Identify the choice that best completes the statement or answers the question.

Simplify the radical expression. Use absolute value symbols if needed.

_____ 2. $\sqrt{36g^6}$

    a. $36g^3$ b. $36g^4$ c. $6g^3$ d. $6g$

_____ 3. $\sqrt[4]{81x^{20}y^8}$

    a. $3x^5y^2$ b. $9x^{25}y^4$ c. $9x^{25}y$ d. $3x^5y^2$

_____ 4. $\sqrt[4]{625x^{28}y^{32}}$

    a. $5x^7y^2$ b. $5x^5y^8$ c. $25x^{25}y^{64}$ d. $25x^{49}y$

Multiply and simplify if possible.

_____ 5. $\sqrt{6} \cdot \sqrt{2}$

    a. $2\sqrt{3}$ b. $\sqrt{12}$ c. $3\sqrt{2}$ d. not possible

_____ 6. $\sqrt[4]{3} \cdot \sqrt[4]{-3}$

    a. -3 b. 3 c. $3\sqrt[4]{-3}$ d. not possible

_____ 7. Simplify $\sqrt[3]{128a^{13}b^6}$. Assume that all variables are positive.

    a. $4a^4b^2\sqrt[3]{2a}$ c. $4a^4b\sqrt[3]{a}$

    b. $2a^4b^2\sqrt[3]{4a}$ d. none of these

_____ 8. Simplify $\sqrt[3]{32a^{16}b^6}$. Assume that all variables are positive.

    a. $2a^5b^2\sqrt[3]{4a}$ c. $2a^5b\sqrt[3]{a}$

    b. $4a^5b^2\sqrt[3]{2a}$ d. none of these

Divide and simplify. Assume that all variables are positive.

_____ 9. $\dfrac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}}$

    a. $2x\sqrt[3]{3x^6}$ b. $3x^6\sqrt[3]{2x}$ c. $\sqrt[3]{135x^{19}}$ d. $3x^6\sqrt{135x}$

_____ 10. $\dfrac{\sqrt{90x^{18}}}{\sqrt{2x}}$

    a. $3x^8\sqrt{5x}$ c. $5x\sqrt{3x^8}$

    b. $\sqrt{18x^{17}}$ d. none of these

Add if possible.

____ 11. $2\sqrt[4]{2x} + 6\sqrt[4]{2x}$

    a. $8\sqrt[4]{4x}$ c. $8\sqrt[4]{2x}$

    b. $16\sqrt[4]{2x}$ d. not possible to simplify

____ 12. $4\sqrt[3]{3x} + 5\sqrt[3]{10x}$

    a. $9\sqrt[3]{13x}$ c. $27\sqrt[3]{10x}$

    b. $27\sqrt[3]{3x}$ d. not possible to simplify

Subtract if possible.

____ 13. $2\sqrt[4]{5a} - 6\sqrt[4]{5a}$

    a. $-20\sqrt[4]{5a}$ c. $-4\sqrt[4]{5a}$

    b. $8\sqrt[4]{5a}$ d. not possible to simplify

____ 14. $2\sqrt[4]{6a} - 4\sqrt[4]{6a}$

    a. $6\sqrt[4]{6a}$ c. $-2\sqrt[4]{6a}$

    b. $-12\sqrt[4]{6a}$ d. not possible to simplify

Solve the equation.

____ 15. $\sqrt{x + 10} - 7 = -5$

    a. 14   b. −8   c. 4   d. −6

____ 16. $3\sqrt{x - 2} - 3 = 6$

    a. 83   b. 11   c. 27   d. 64

____ 17. $\sqrt{x - 9} + 3 = 8$

    a. 25   b. 14   c. 34   d. 16

____ 18. $(x - 7)^{\frac{2}{3}} = 4$

    a. 11   b. 15; −1   c. −3   d. 1; −1

____ 19. $(x + 6)^{\frac{2}{3}} = 4$

    a. −2   b. 14; −14   c. 10   d. 2; −14

Solve. Check for extraneous solutions.

____ 20. $6x = \sqrt{24 + 12x}$

    a. $-\dfrac{2}{3}$ b. −1   c. 1 and $-\dfrac{2}{3}$ d. 1