6-2 Practice

Form K

Multiplying and Dividing Radical Expressions

Multiply, if possible. Then simplify. To start, identify the index of each radical.

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

index of both radicals is 3

$\sqrt[3]{4 \cdot 6}$

2. $\sqrt{5} \cdot \sqrt{8}$

3. $\sqrt[3]{6} \cdot \sqrt[4]{9}$

Simplify. Assume all variables are positive. To start, change the radicand to factors with the necessary exponent.

4. $\sqrt[3]{27x^6}$

$= \sqrt[3]{3^3 \cdot (x^2)^3}$

5. $\sqrt{48x^3y^4}$

6. $\sqrt[5]{128x^2y^{25}}$

Multiply and simplify. Assume all variables are positive.

7. $\sqrt{12} \cdot \sqrt{3}$

8. $\sqrt[4]{7x^6} \cdot \sqrt[4]{32x^2}$

9. $2\sqrt[3]{6x^4y} \cdot 3\sqrt[3]{9x^5y^2}$

Simplify each expression. Assume all variables are positive.

10. $\sqrt[3]{4} \cdot \sqrt[3]{80}$

11. $5\sqrt{2xy^6} \cdot 2\sqrt{2x^3y}$

12. $\sqrt{5}\left(\sqrt{5} + \sqrt{15}\right)$

13. Error Analysis Your classmate simplified $\sqrt{5x^3} \cdot \sqrt[3]{5xy^2}$ to $5x^2y$. What mistake did she make? What is the correct answer?

14. A square rug has sides measuring $\sqrt[3]{16}$ ft by $\sqrt[3]{16}$ ft. What is the area of the rug?

6-2

Practice (continued)   *Form K*

Multiplying and Dividing Radical Expressions

Divide and simplify. Assume all variables are positive. To start, write the quotient of roots as a root of a quotient.

15. $\dfrac{\sqrt{36x^6}}{\sqrt{9x^4}}$

$= \sqrt{\dfrac{36x^6}{9x^4}}$

16. $\dfrac{\sqrt[4]{405x^8y^2}}{\sqrt[4]{5x^3y^2}}$

17. $\dfrac{\sqrt[3]{75x^7y^2}}{\sqrt[4]{25x^4}}$

Rationalize the denominator of each quotient. Assume all variables are positive. To start, multiply the numerator and denominator by the appropriate radical expression to eliminate the denominator.

18. $\dfrac{\sqrt{26}}{\sqrt{3}}$

$= \dfrac{\sqrt{26}}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}}$

19. $\dfrac{\sqrt[3]{x}}{\sqrt[3]{2}}$

20. $\dfrac{\sqrt{7x^4y}}{\sqrt{5xy}}$

21. Einstein's famous formula $E = mc^2$ relates energy E, mass m, and the speed of light c. Solve the formula for c. Rationalize the denominator.

22. The formula $h = 16t^2$ is used to measure the time t it takes for an object to free fall from height h. If an object falls from a height of $h = 18a^5$ ft, how long did it take for the object in terms of a?