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Practice

Form G

Multiplying and Dividing Radical Expressions

Multiply, if possible. Then simplify.

1. $\sqrt{4} \cdot \sqrt{25}$

2. $\sqrt{81} \cdot \sqrt{36}$

3. $\sqrt{3} \cdot \sqrt[3]{27}$

4. $\sqrt[3]{45} \cdot \sqrt[3]{75}$

5. $\sqrt{18} \cdot \sqrt{50}$

6. $\sqrt[3]{-16} \cdot \sqrt[3]{4}$

Simplify. Assume that all variables are positive.

7. $\sqrt{36x^3}$

8. $\sqrt[3]{125y^2z^4}$

9. $\sqrt{18k^6}$

10. $\sqrt[3]{-16a^{12}}$

11. $\sqrt{x^2y^{10}z}$

12. $\sqrt[4]{256s^7t^{12}}$

13. $\sqrt[3]{216x^4y^3}$

14. $\sqrt{75r^3}$

15. $\sqrt[4]{625u^5v^8}$

Multiply and simplify. Assume that all variables are positive.

16. $\sqrt{4} \cdot \sqrt{6}$

17. $\sqrt{9x^2} \cdot \sqrt{9y^5}$

18. $\sqrt[3]{50x^2z^5} \cdot \sqrt[3]{15y^3z}$

19. $4\sqrt{2x} \cdot 3\sqrt{8x}$

20. $\sqrt{xy} \cdot \sqrt{4xy}$

21. $9\sqrt{2} \cdot 3\sqrt{y}$

22. $\sqrt{12x^2y} \cdot \sqrt{3xy^4}$

23. $\sqrt[3]{-9x^2y^4} \cdot \sqrt[3]{12xy}$

24. $7\sqrt{3y^2} \cdot 2\sqrt{6x^3y}$

Divide and simplify. Assume that all variables are positive.

25. $\frac{\sqrt{75}}{\sqrt{3}}$

26. $\frac{\sqrt{63xy^3}}{\sqrt{7y}}$

27. $\frac{\sqrt{54x^5y^3}}{\sqrt{2x^2y}}$

28. $\frac{\sqrt{6x}}{\sqrt{3x}}$

29. $\frac{\sqrt[3]{4x^2}}{\sqrt[3]{x}}$

30. $\frac{\sqrt[4]{243k^3}}{\sqrt[4]{3k^7}}$

31. $\frac{\sqrt{(2x)^2}}{\sqrt{(5y)^4}}$

32. $\frac{\sqrt[3]{18y^2}}{\sqrt[3]{12y}}$

33. $\sqrt{\frac{162a}{6a^3}}$

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Practice (continued)

Form G

Multiplying and Dividing Radical Expressions

Rationalize the denominator of each expression. Assume that all variables are positive.

34. $\frac{\sqrt{y}}{\sqrt{5}}$

35. $\frac{\sqrt{18x^2y}}{\sqrt{2y^3}}$

36. $\frac{\sqrt[3]{7xy^2}}{\sqrt[3]{4x^2}}$

37. $\sqrt{\frac{9x}{2}}$

38. $\frac{\sqrt{xy}}{\sqrt{3x}}$

39. $\sqrt[3]{\frac{x^2}{3y}}$

40. $\frac{\sqrt[4]{2x}}{\sqrt[4]{3x^2}}$

41. $\sqrt{\frac{x}{8y}}$

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

43. What is the area of a rectangle with length $\sqrt{175}$ in. and width $\sqrt{63}$ in.?

44. The area of a rectangle is 30 m^2 . If the length is $\sqrt{75}$ m, what is the width?

45. The volume of a right circular cone is $V = \frac{1}{3}\pi r^2 h$, where r is the radius of the base and h is the height of the cone. Solve the formula for r . Rationalize the denominator.

46. The volume of a sphere of radius r is $V = \frac{4}{3}\pi r^3$.

- Use the formula to find r in terms of V . Rationalize the denominator.
- Use your answer to part (a) to find the radius of a sphere with volume 100 cubic inches. Round to the nearest hundredth.

Simplify each expression. Rationalize all denominators. Assume that all variables are positive.

47. $\sqrt{14} \cdot \sqrt{21}$

48. $\sqrt[3]{150} \cdot \sqrt[3]{20}$

49. $\sqrt{3}(\sqrt{12} - \sqrt{6})$

50. $\frac{6\sqrt{2x}}{5\sqrt{3}}$

51. $\frac{8}{\sqrt[3]{2x^2}}$

52. $\frac{5\sqrt[3]{xy^4}}{\sqrt[3]{25xy^2}}$