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Additional Exercises 7.3
Form I
Multiplying and Simplifying Radical Expressions

Use the product rule to multiply.

1. $\sqrt{6} \cdot \sqrt{5}$ 1. _____

2. $\sqrt[3]{4} \cdot \sqrt[3]{3}$ 2. _____

3. $\sqrt{(x+4)} \cdot \sqrt{(x-4)}$ 3. _____

4. $\sqrt[3]{3x} \cdot \sqrt[3]{2x}$ 4. _____

Simplify by factoring. Assume that all variables in a radicand represents positive real numbers and no radicands involve negative quantities raised to even powers.

5. $\sqrt{90}$ 5. _____

6. $\sqrt{108}$ 6. _____

7. $\sqrt{45x}$ 7. _____

8. $\sqrt[3]{2xy^2} \cdot \sqrt[3]{2xy^2} \cdot \sqrt[3]{20xy^2}$ 8. _____

9. $\sqrt[3]{24x^{12}}$ 9. _____

10. $\sqrt[3]{48x^6y^7}$ 10. _____

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11. $\sqrt[4]{x^4 y^8 z^{10}}$ 11. _____

12. $\sqrt[5]{(a+b)^7}$ 12. _____

Express the function in simplified form. Assume that x can be any real number.

13. $f(x) = \sqrt{(x-1)^4}$ 13. _____

14. $f(x) = \sqrt{100(x+3)^8}$ 14. _____

15. $f(x) = \sqrt{x^2 + 4x + 4}$ 15. _____

Multiply and simplify. Assume that all variables in a radicand represent positive real numbers.

16. $\sqrt{5} \cdot \sqrt{12}$ 16. _____

17. $\sqrt{18} \cdot \sqrt{6}$ 17. _____

18. $\sqrt{7x} \cdot \sqrt{12y^2}$ 18. _____

19. $\sqrt[3]{12x^2} \cdot \sqrt[3]{4xy^5}$ 19. _____

20. $\sqrt[4]{5x^5 y^5} \cdot \sqrt[4]{32xy^3}$ 20. _____

Additional Exercises 7.3
Form II
Multiplying and Simplifying Radical Expressions

Use the product rule to multiply.

1. $\sqrt[4]{7} \cdot \sqrt[4]{4}$ 1. _____

2. $\sqrt{(x+4)} \cdot \sqrt{(x-2)}$ 2. _____

3. $\sqrt[3]{5x} \cdot \sqrt[3]{3x}$ 3. _____

4. $\sqrt[5]{4xy^2} \cdot \sqrt[5]{2x^2y^2}$ 4. _____

Simplify by factoring. Assume that all variables in a radicand represents positive real numbers and no radicands involve negative quantities raised to even powers.

5. $\sqrt{75}$ 5. _____

6. $\sqrt{150}$ 6. _____

7. $\sqrt[3]{72}$ 7. _____

8. $\sqrt[3]{48x^6y^2}$ 8. _____

9. $\sqrt[4]{96x^3y^5}$ 9. _____

10. $\sqrt[3]{48x^6y^7}$ 10. _____

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11. $\sqrt[5]{256x^{12}}$ 11. _____

12. $\sqrt[11]{(x+y)^{12}}$ 12. _____

Express the function in simplified form. Assume that x can be any real number.

13. $f(x) = \sqrt{100(x-1)^8}$ 13. _____

14. $f(x) = \sqrt[3]{3000(x+1)^6}$ 14. _____

15. $f(x) = \sqrt{3x^2 + 30x + 75}$ 15. _____

Multiply and simplify. Assume that all variables in a radicand represent positive real numbers.

16. $\sqrt{18} \cdot \sqrt{9}$ 16. _____

17. $\sqrt{12x} \cdot \sqrt{4x^3} \cdot \sqrt{2x^2}$ 17. _____

18. $\sqrt[3]{18} \cdot \sqrt[3]{6}$ 18. _____

19. $\sqrt[4]{8} \cdot \sqrt[4]{4} \cdot \sqrt[4]{5}$ 19. _____

20. Racing cyclists use the function $r(x) = 4\sqrt{x}$ to determine the maximum rate, $r(x)$, in miles per hour, to turn a corner of radius x , in feet, without tipping over. What is the maximum rate a cyclist should travel around a corner of radius 18 feet without tipping over? Give the solution in simplified radical form, and then give the answer rounded to the nearest mile per hour. 20. _____

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Form III

Multiplying and Simplifying Radical Expressions

Use the product rule to multiply.

1. $\sqrt[5]{3} \cdot \sqrt[5]{6} \cdot \sqrt[5]{5}$ 1. _____

2. $\sqrt{x-5} \cdot \sqrt{x+7}$ 2. _____

3. $\sqrt[3]{2xy} \cdot \sqrt[3]{3x}$ 3. _____

4. $\sqrt[5]{\frac{x}{81}} \cdot \sqrt[4]{\frac{81}{y^4}}$ 4. _____

Simplify by factoring. Assume that all variables in a radicand represents positive real numbers and no radicands involve negative quantities raised to even powers.

5. $\sqrt{180}$ 5. _____

6. $\sqrt[3]{96}$ 6. _____

7. $\sqrt[4]{80x^4}$ 7. _____

8. $\sqrt{x^{13}}$ 8. _____

9. $\sqrt[3]{8x^3y^9z^4}$ 9. _____

10. $\sqrt[5]{64x^4y^5z^6}$ 10. _____

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11. $\sqrt[3]{(x+1)^2(x+1)}$ 11. _____

12. $\sqrt[6]{(x-3)^8}$ 12. _____

Express the function in simplified form. Assume that x can be any real number.

13. $f(x) = \sqrt[3]{1000(x+4)^6}$ 13. _____

14. $f(x) = \sqrt{4x^2 + 32x + 64}$ 14. _____

15. $f(x) = \sqrt{64x^2 + 320x + 400}$ 15. _____

Multiply and simplify. Assume that all variables in a radicand represent positive real numbers.

16. $\sqrt{24} \cdot \sqrt{5}$ 16. _____

17. $\sqrt{3x} \cdot \sqrt{6x^2} \cdot \sqrt{4x^3}$ 17. _____

18. $\sqrt[4]{9} \cdot \sqrt[4]{27}$ 18. _____

19. $\sqrt[3]{6x^{10}y} \cdot \sqrt[3]{4x^{16}y^{13}}$ 19. _____

20. $\sqrt[9]{x+1} \cdot \sqrt[9]{(x+1)^{37}}$ 20. _____