

Chapter Review

Lesson 2.1

Review Example

Simplify the following expression.

$$\frac{(3s^2t^3)^2}{9s^3t^4}$$

Use the Power of a Product Property to simplify the numerator. Then use the Quotient of Powers Property.

$$\begin{aligned} &= \frac{3^2 s^{2 \cdot 2} t^{3 \cdot 2}}{9s^3t^4} \\ &= \frac{9s^4t^6}{9s^3t^4} \\ &= st^2 \end{aligned}$$

Student Review Exercises

Simplify each expression.

- $(a^2b)^3(ab)$
- $\frac{8x^3y^5}{4x^{-1}}$
- Use the formula $V = \frac{4}{3}\pi r^3$ to find the volume of a basketball with a radius of 1.15×10^2 millimeters. Express the answer using scientific notation. Round the answer to two significant digits.

Lesson 2.2

Review Example

Simplify the following expression.

$$(\sqrt{5} - \sqrt{2})(\sqrt{5} + 2\sqrt{2})$$

Use the FOIL method to multiply the radical expressions.

$$\begin{array}{cccc} \text{First} & \text{Outer} & \text{Inner} & \text{Last} \\ \sqrt{5}\sqrt{5} + \sqrt{5}(2\sqrt{2}) - \sqrt{2}\sqrt{5} - \sqrt{2}(2\sqrt{2}) \\ = \sqrt{5}\sqrt{5} + 2\sqrt{5}\sqrt{2} - \sqrt{2}\sqrt{5} - 2\sqrt{2}\sqrt{2} \\ = 5 + 2\sqrt{10} - \sqrt{10} - 2(2) \\ = 1 + \sqrt{10} \end{array}$$

Student Review Exercises

Simplify each expression.

- $14\sqrt{20} - 3\sqrt{125}$
- $(3 + \sqrt{5})(1 + \sqrt{5})$
- The formula $V = \frac{4}{3}\pi r^3$ gives the volume of a sphere with radius length r . Rewrite the formula by solving for r . What is the length of the radius of a gumball with a volume of 1.75 cubic centimeters? Round to the nearest hundredth.

Lessons 2.3

Review Example

Find the real number root of $\sqrt[4]{81}$.

Factor the radicand to rewrite the expression.

$$\sqrt[4]{81} = \sqrt[4]{3^4}$$

Use the definition of n th roots to simplify the expression.

$$\sqrt[4]{3^4} = 3$$

Student Review Exercises

Find each real number root.

- $\sqrt[3]{-125}$
- $\sqrt[6]{64}$
- The expression $A = 10,000(1.05)^{1.75}$ gives the amount of money in a certificate of deposit if \$10,000 is invested at 5% interest for 21 months. Evaluate this expression to find the balance of the account. Round to the nearest cent.

Lesson 2.4

Review Example

Solve the radical equation.

$$2(x-1)^{\frac{4}{3}} + 10 = 42$$

Subtract 10 from each side. Then divide each side by 2.

$$2(x-1)^{\frac{4}{3}} + 10 - 10 = 42 - 10$$

$$2(x-1)^{\frac{4}{3}} = 32$$

$$(x-1)^{\frac{4}{3}} = 16$$

Raise each side of the equation to the $\frac{3}{4}$ power. Then solve for x .

$$\left((x-1)^{\frac{4}{3}}\right)^{\frac{3}{4}} = 16^{\frac{3}{4}}$$

$$x - 1 = 8$$

$$x = 9$$

Student Review Exercises

Solve each equation. Check for extraneous solutions.

10. $\sqrt{2x-1} + 2 = 5$

11. $(2x+3)^{\frac{3}{4}} = 8$

12. The expression $28(0.5)^{\frac{12}{5}}$ gives the amount of caffeine, in milligrams, left in a student's system 12 hours after drinking a soft drink. Simplify the expression to find the amount of caffeine in the student's system. Round the answer to the nearest tenth.

Lesson 2.5

Review Example

Simplify the expression $2i(3+i)(5-9i)$.

$$2i(3+i)(5-9i)$$

$$= 2i(15 - 27i + 5i - 9i^2) \quad \text{FOIL method.}$$

$$= 2i(15 - 27i + 5i + 9) \quad i^2 = -1$$

$$= 2i(24 - 22i) \quad \text{Combine real parts and imaginary parts.}$$

$$= 48i - 44i^2 \quad \text{Distribute } 2i.$$

$$= 48i + 44 \quad i^2 = -1$$

$$= 44 + 48i \quad \text{Write in the form } a + bi.$$

Student Review Exercises

Simplify each expression.

13. $6(5-2i) + (1-4i)$

14. $(3-5i)(8+i)$

15. $(4+8i) - (-2-i)$

16. $-i^2(-5+3i) + (7-10i)$

17. Triangle ABC is plotted on a complex plane. Point A is located 10 units to the right of point B . Point C is located $6i$ units above point B . Use the Pythagorean Theorem to find the length of the hypotenuse, \overline{AC} .