4.   Express each of the mixed radicals as an entire radical.

    a. $5\sqrt{2}$

$$5\sqrt{2} = \sqrt{5^2 \times 2}$$
$$= \sqrt{25 \times 2}$$
$$= \sqrt{50}$$

    b. $2\sqrt[3]{9}$

$$2\sqrt[3]{9} = \sqrt[3]{2^3} \times \sqrt[3]{9}$$
$$= \sqrt[3]{2^3 \times 9}$$
$$= \sqrt[3]{8 \times 9}$$
$$= \sqrt[3]{72}$$

Please complete *Lesson 4.2 Explore Your Understanding Assignment* located in *Workbook 4.2* before proceeding to *Lesson 4.3*.

Lesson 4.3: The Irrational Number System

Practice – III

1.   What is the difference between Rational, Irrational, and Real Numbers?
    Rational Numbers can be written as fractions and as repeating or terminating decimals. Irrational Numbers are non-terminating and non-repeating decimals. The Real Number system comprises both Rational and Irrational Numbers.

2.   Using benchmarks, what is the approximate value of $\sqrt[3]{2\,185}$?

$$\sqrt[3]{1\,728} < \sqrt[3]{2\,185} < \sqrt[3]{2\,197}$$
$$\sqrt[3]{12^3} < \sqrt[3]{2\,185} < \sqrt[3]{13^3}$$
$$12 < \sqrt[3]{2\,185} < 13$$
$$\sqrt[3]{2\,185} \doteq 12.9$$

3.   Classify each of the following numbers according to the subsets to which they belong.

   a. $-\sqrt[3]{-343} = -1 \times \sqrt[3]{(-7)^3} = -1 \times (-7) = 7$
   Natural, Whole, Integer, Rational, Real

   b. $-\sqrt{81} = -\sqrt{9^2} = -9$ Integer, Rational, Real

   c. $-\dfrac{\sqrt[3]{64}}{3} = -\dfrac{\sqrt[3]{64}}{3} = -\dfrac{4}{3}$ Rational, Real

4.   Arrange the following numbers from greatest to least.
   $-\sqrt[3]{-8}, \sqrt[3]{-8}, \sqrt[3]{-27}, -\sqrt[3]{1}, \sqrt[3]{27}$

   $-\sqrt[3]{-8} = -1 \times \sqrt[3]{(-2)^3} = -1 \times -2 = 2$
   $\sqrt[3]{-8} = \sqrt[3]{(-2)^3} = -2$
   $\sqrt[3]{-27} = \sqrt[3]{(-3)^3} = -3$
   $-\sqrt[3]{1} = -1 \times \sqrt[3]{1^3} = -1 \times 1 = -1$
   $\sqrt[3]{27} = \sqrt[3]{(3)^3} = 3$

   The order from greatest to least is: $\sqrt[3]{27}, -\sqrt[3]{-8}, -\sqrt[3]{1}, \sqrt[3]{-8}, \sqrt[3]{-27}$.

Please complete *Lesson 4.3 Explore Your Understanding Assignment* located in *Workbook 4.3* before proceeding to *Lesson 4.4*.

Lesson 4.4: Exponent Laws

Practice – IV

1.   Apply the exponent laws to simplify the following expressions.

   a. $\dfrac{(2x^{12}y^2)(7x^{-4}y^7)}{(28x^2y)(xy^2)}$

   $\dfrac{(2x^{12}y^2)(7x^{-4}y^7)}{(28x^2y)(xy^2)} = \dfrac{14x^8y^9}{28x^3y^3}$
   $= \dfrac{x^5y^6}{2}$