Sample Grade 8 Independent Practice Assignment Sheet

Essential Learning Standards

- I can differentiate between rational and irrational numbers. (Section 2.1)
- I can write, evaluate expressions, and solve equations involving square and cube roots. (Section 2.2)
- I can simplify expressions using the properties of exponents. (Section 2.3)
- I can represent very large or very small numbers using scientific notation. (Section 2.4)

Skill Practice

Solve.

a. 5^3
b. 2^6
c. $3^2 \div 4^3$
d. $(9^2 - 3^3)^2$

Evaluate given that $a = 5$, $b = 2$, and $c = 3$.

a. $a^2 + c^4$
b. $a^3 - b^5$
c. $b^c + a^b - b^a$

Section 2.1

Complete the following table.

Rational Number	Decimal Expansion
$\frac{4}{9}$	
	7.12
$\frac{5}{11}$	
	0.75

Explain how you were able to change a decimal expansion into a rational number.

Identify each number as rational or irrational. Explain how you know.

a. $\sqrt{64}$
b. 0.16
c. $\sqrt{3}$
d. $1.\underline{3}$
e. 12.69
f. $-\sqrt{15}$

You can use the formula $d = \sqrt{1.5h}$ to estimate the distance d, in miles, to a horizon line when your eyes are h feet above the ground.

a. Determine the distance to the horizon seen by a lifeguard whose eyes are 10 feet above the ground.

b. Is this distance an irrational or rational number? Explain your answer.

Which decimal is the equivalent of $\frac{7}{12}$? Select your answer.

☐ $0.58\overline{3}$
☐ $\overline{0.583}$
☐ 0.583
☐ $0.5\overline{83}$

Section 2.2

Evaluate the following expressions:

a. $\sqrt[3]{8}$

b. $\sqrt[3]{64}$

c. $\sqrt{25}$

d. $\sqrt{64}$

e. $\sqrt{100}$

f. $\sqrt[3]{1000}$

Determine if each statement is true or false.

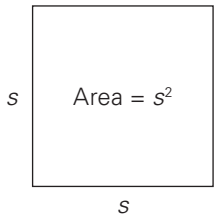
a. $\sqrt{49} < \sqrt[3]{343}$ ☐ or ☐

b. $\sqrt[3]{125} = \sqrt{25}$ ☐ or ☐

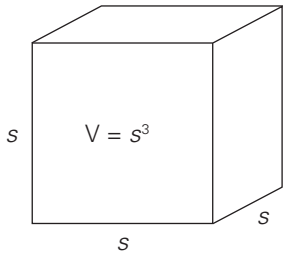
c. $\sqrt[3]{729} = \sqrt{9}$ ☐ or ☐

d. $\sqrt[3]{1000} > \sqrt{144}$ ☐ or ☐

The area of this square is 81 mm^2.
What is the length of each side?



The volume for this cube is 27 cm^3.



What is the area of each face?

Jona and Kira gave the following responses when they shared aloud in their groups.

Jona's response: "I think each side length is 9 cm, so the area of each face would be 81cm^2."

Kira's response: "I think each side length is 3 cm, so the area of each face would be 9cm^2."

Prove who is correct. Use the following to guide your response:

- What work would have been on each student's paper?
- Explain the steps used to find the correct answer.

Identify the error made in the incorrect response.

Section 2.3

Carla was asked to complete the following chart. Her teacher told her that there were some errors, but she did not share where the errors were. Help Carla by circling the error and explaining the mistake.

Problem	Exponent Form	Standard Form

Which expressions are equivalent to $\frac{1}{37}$? Select all that apply.

- ☐ $3^{-4} \cdot 3^{-3}$
- ☐ $3^{-5} \cdot 3^{2}$
- ☐ $3^{6} \cdot 3$
- ☐ $3^{5} \cdot 3^{-12}$
- ☐ $3^{-7} \cdot 3^{1}$
- ☐ $3^{2} \cdot 3^{-9}$

If $a = -3$, $b = 6$ and $c = -5$, write the following in exponent form.

a. $b^a \cdot b^c$

b. $\frac{b^b}{b^a}$

c. $c^a \cdot c^b$

d. $8^c \cdot 8^a \cdot 8^b$

Provide values for the variables to make the statements true.

a. $9^m \cdot 9^n = 9^p$

b. $8^w \cdot x^{-5} = 8^y$

Section 2.4	
The largest Iceberg to split off from the Ross Ice shelf weighed four trillion tons. a. Write the number in scientific notation. b. Write a number in scientific notation 10 times greater than the weight of the Iceberg.	Willie Day and his twin brother Wally Day combined to hit home runs during their 20-year baseball career. The Way brothers, Burt and Curt, hit 5 times the number of home runs hit by the Day brothers. Write the number of Way brother home runs in scientific notation.
The speed of light is 3×10^8 meters per second. If the sun is 1.5×10^{11} meters from earth, how many seconds does it take light to reach the earth? Express your answer in scientific notation.	Solve the following and write your solution in scientific notation: a. $2{,}850(3.6 \times 10^2)$ b. $(2.19 \times 10^{-3})(1.7 \times 10^2)$ c. $(-1.08 \times 10^2) \div (6 \times 10^{-2})$

Source: Adapted from © 2015 by Howard County Public School System, Office of Mathematics.