Name _____ Period _____ Date _____

Grade 8 Unit 2 Model Curriculum Assessment

For multiple-choice questions, circle the best answer.
For all other questions, respond in the space provided.

1. Classify each number as rational or irrational by checking the appropriate box in the table below.

Number	Rational	Irrational
$\frac{5}{7}$		
2π		
$(\sqrt{2})^2$		

2. Which of the following is equivalent to $0.\overline{13}$?

a. $\frac{1}{8}$

b. $\frac{13}{100}$

c. $\frac{13}{99}$

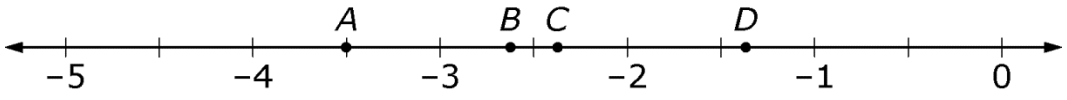
d. $\frac{1}{3}$

3. The number $0.1010010001K$ is formed by continuing the decimal indefinitely with an additional 0 in each successive group of zeros separated by a 1. Is $0.1010010001K$ a rational number or an irrational number? Explain your reasoning.

4. Is the number $\sqrt{169}$ a rational number or an irrational number? Explain your reasoning.

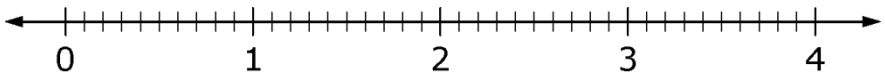
5. The number $\sqrt{136}$ is approximately how many times $\sqrt{33}$? Give your answer to the nearest integer.

6. Which of the following points on the number line below best approximates the value of $-\sqrt{7}$?



a. *A*
b. *B*
c. *C*
d. *D*

7. Plot the numbers 2.5, $\sqrt{8}$, $\frac{20}{9}$, and $\frac{p}{2}$ on the number line below. Label each point with the number given.



8. Which of the following is equivalent to $\frac{7^2 \times 7^5 \times 2^2}{7^3 \times 2^6}$?

a. $7^{10} \times 2^8$

b. $7^4 \times 2^4$

c. $\left(\frac{16}{9}\right)^9$

d. $\left(\frac{7}{2}\right)^4$

9. Which of the following is equivalent to $5^2 + 5^2$?

a. 2×5^2
b. 10^2
c. 5^4
d. 20

10. Indicate whether each expression is equivalent to the product $8^3 \times 8^3$ by checking the appropriate box in the table below.

	Equivalent	Not Equivalent
64^3		
2^{12}		
2×8^3		
8^6		

11. Rewrite the expression $\frac{6^{10} \times 6^{-4}}{6^{-5} \times 6^2}$ as a single term of the form 6^n, where n is an integer. Show your work.

12. In the equation $9^2 \times 27^3 = 3^x$, what is the value of x ? Show your work.

13. The average distance from Venus to the Sun is 108,200,000 kilometers. Which of the following is the number expressed in scientific notation?

    a. 1.082×10^5
    b. 1.82×10^6
    c. 1.082×10^8
    d. 1.82×10^8

14. A scientist measured the wavelength of an X-ray as 0.0000000065 meters. Write the number in scientific notation.

15. The population of Greenville is approximately 75 times the population of Fairview. There are 3.75×10^5 people living in Greenville.

    Approximately how many people are living in Fairview?

    a. 5×10^3
    b. 5×10^4
    c. 3×10^6
    d. 3×10^7

16. The area of Canada is approximately 1×10^{7} square kilometers, and the area of Mexico is approximately 2×10^{6} square kilometers. The

area of Canada is approximately how many times the area of Mexico?

Explain how you found your answer.

17. The mass of an electron is approximately 9.1×10^{-31} kilograms. The mass of a proton is approximately 1.7×10^{-27} kilograms.

Approximately how many times greater is the mass of a proton

than the mass of an electron?

a. 1,900
b. 5,500
c. 19,000
d. 55,000

18. A scientist measured the wavelength of an orange light wave as

0.000000615 meters. A second scientist measured the wavelength of a green light wave as 5.6×10^{-7} meters. How much longer, in meters, was the orange light wave than the green light wave?

a. 5.5×10^{-14}

b. 5.5×10^{-8}

c. 5.5×10^{-7}

d. 5.5×10^{-6}

19. Last year, Company *T* sold 2.8×10^{6} vehicles, and Company *H* sold 15 percent of the number of vehicles that Company *T* sold. How many vehicles did Company *H* sell last year? Show your work, and give your answer in scientific notation.

20. What is the quotient of 2.408×10^{24} divided by 6.02×10^{23} ? Show your work.

21. One cubic meter contains 1×10^{3} liters and one liter contains 1×10^{3} milliliters. How many milliliters are in 2.5×10^{2} cubic meters?

a. 2.5×10^{-4}

b. 2.5×10^{4}

c. 2.5×10^{6}

d. 2.5×10^{8}

22. An adult leatherback turtle weighs 750 kilograms. This is approximately 1.5×10^4 times its weight when it hatched. To express the weight of the turtle when it hatched so that the number of units will be the least possible whole number value, which of the following units of measure should be used?

(Note: 1 metric ton = 1,000 kilograms.)

a. Metric tons
b. Kilograms
c. Grams
d. Milligrams

23. The average distance from the Sun to Mars is 22,793,910,000,000 centimeters. The conversion factors between centimeters and four other units of measure are shown below.

9.46×10^{17} cm = 1 light-year
1.50×10^{13} cm = 1 astronomical unit
1×10^5 cm = 1 kilometer
1×10^2 cm = 1 meter

For the distance to be expressed as x units of measure, where $1 \leq x \leq 10$, which unit of measure must be used?

a. Light-years
b. Astronomical units
c. Kilometers
d. Meters

24. A plot of land has an area of 1,089,000 square feet. The conversion factors between different area measures are shown below.

27,878,400 square feet = 1 square mile
43,560 square feet = 1 acre
9 square feet = 1 square yard
1 square foot = 144 square inches

Part A Which unit listed above can be used to express the area of the plot of land so that the number of units will be between 10 and 100? Explain your answer.

Part B What is the area of the plot of land in terms of the unit you chose in part A ?