

**- - - 8th Grade - - - Unit 2 - - - Study Guide - - -**

1) The equation  $x^2 = -16$  has \_\_\_\_\_.

- ☐ A no solution
- ☐ B one solution
- ☐ C two solutions
- ☐ D three solutions

2) Solve.

$$x^2 = 25$$

- ☐ A The equation has no solutions.
- ☐ B  $-5$  is the only solution.
- ☐ C  $5$  is the only solution.
- ☐ D  $5$  and  $-5$  are both solutions.

3) Choose all the expressions that are equivalent to  $2^2 \cdot 2^5$ ? There may be more than one equivalent expression.

- ☐ A  $2^2 \cdot 2^2 \cdot 2^3$
- ☐ B  $4^{10}$
- ☐ C  $4^{2+5}$
- ☐ D  $2^7$
- ☐ E  $2^{10}$

4) Look at this table of powers of 2.

$2^{10} = 1,024$	$2^3 = 8$	$2^{-4} = 0.0625$
$2^9 = 512$	$2^2 = 4$	$2^{-5} = \underline{\hspace{2cm}}$
$2^8 = \underline{\hspace{2cm}}$	$2^1 = 2$	$2^{-6} = 0.015625$
$2^7 = 128$	$2^0 = 1$	$2^{-7} = 0.0078125$
$2^6 = 64$	$2^{-1} = 0.5$	$2^{-8} = 0.00390625$
$2^5 = 32$	$2^{-2} = 0.25$	$2^{-9} = 0.001953125$
$2^4 = 16$	$2^{-3} = 0.125$	$2^{-10} = 0.0009765625$

- a. What is the value of  $2^8$ ?
- b. What is the value of  $2^{-4}$  as a power of 4?
- c. What is the value of  $2^{-5}$ ?

5) Simplify.  $\frac{6.9 \cdot 10^5}{3 \cdot 10^3}$

- ☐ A  $2.07 \cdot 10^3$
- ☐ B  $2.3 \cdot 10^8$
- ☐ C  $2.07 \cdot 10^2$
- ☐ D  $2.3 \cdot 10^2$

6) The circumference of Neptune's orbit around the sun is about 17,562,000,000 mi.

Write the measurement in scientific notation.

\_\_\_\_\_ mi

7) Simplify.  $(3 \cdot 10^6)(4 \cdot 10^{-2})$

- ☐ A  $12 \cdot 10^{-4}$
- ☐ B  $7 \cdot 10^{-8}$
- ☐ C  $12 \cdot 10^4$
- ☐ D  $7 \cdot 10^{-12}$

8) Which of these lists of numbers is in order from least to greatest?

A  $\sqrt[3]{27}, \sqrt{10}, \frac{10}{3}$

B  $\frac{10}{3}, \sqrt[3]{27}, \sqrt{10}$

C  $\sqrt{10}, \sqrt[3]{27}, \frac{10}{3}$

D  $\sqrt[3]{27}, \frac{10}{3}, \sqrt{10}$

9) Which of these rational numbers has a decimal form that terminates?

A  $\frac{7}{8}$

B  $\frac{7}{11}$

C  $\frac{5}{12}$

D  $\frac{1}{7}$

10) What is the fraction form of  $0.\overline{27}$ ?

11) Which of these numbers are irrational numbers? There may be more than one irrational number.

A  $9\pi$

B 0.4321

C  $\sqrt[3]{27}$

D  $-\frac{17}{47}$

E  $\sqrt{2}$

12) Compare the two expressions and choose  $<$ ,  $>$ , or  $=$ .

$2\pi$  \_\_\_\_\_  $\sqrt{37}$

13) Find the number that is half of this number.

$4.28 \times 10^{31}$

Write your answer in scientific notation.

14) The diameter of a fluorine ion is 0.000000000038 m. The diameter of a small grain of sand is about 0.00002 m.

- Write an estimate of each diameter in scientific notation as a single digit times a power of 10.
- Use your numbers written in scientific notation to help you write a statement comparing the two diameters.