Level 4: Irrational Numbers and Integer Exponents Pre-Test

Question 1:

$x = 5^3$ and $y = 5^{-3}$

Express y in terms of x.

$y =$ ☐

Question 2:

Write 0.555... as a ratio of two integers.

Question 3:

Write $\sqrt{8}$ as a decimal rounded to the nearest thousandth.

Question 4:

Which of the following is a repeating decimal?

a. $\frac{2}{3}$

b. $\frac{1}{50}$

c. $\frac{3}{75}$

d. $\frac{25}{8}$

Question 5:

What is the greatest integer that is a solution to the following inequality?

$8 > \sqrt{x}$

Question 6:

Between which two consecutive integers is the value of $\sqrt{17}$?

$\sqrt{17}$ is between ____ and ____.

Question 7:

The mass of an electron is approximately 9.109×10^{-31} kilograms.

Which of the following is closest to that number?

a. 1×10^{-29}

b. 1×10^{-30}

c. 1×10^{-31}

d. 1×10^{-32}

Question 8:

A student collected 50 ants. The average mass of one ant was 7.2×10^{-2} grams.

What was the total mass of the 50 ants?

a. 0.36 g

b. 3.6 g

c. 36 g

d. 360 g

Question 9:

Which of the following could be an irrational number?

a. $\frac{-5}{7}$

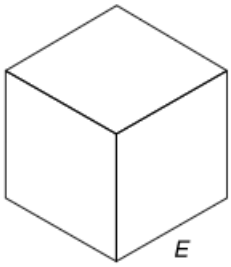
b. $\sqrt{49}$

c. $2.6457...$

d. $3.\overline{14765}$

Question 10:

The relationship between V , the volume of a cube, and E , the length of each edge of that cube, is shown below.



$\sqrt[3]{V} = E$

What is the length, in inches, of each edge of a cube that has a volume of 64 cubic inches?

inches

Question 11:

The closest star to Earth is the sun, which is 1.5×10^{8} kilometers away. The closest star to the sun is Proxima Centauri, which is 40 trillion kilometers away from the sun.

To the nearest ten thousand, how many times farther away is Proxima Centauri from the sun than the sun is from Earth?

Question 12:

A scientist measured the mass of a grain of sand to be 8.5×10^{-4} gram.

Write 8.5×10^{-4} as a number in standard form.

Question 13:

One sample of ammonia has a mass of 17 grams and contains 6.02×10^{23} atoms of nitrogen.

How many atoms of nitrogen are in 1 gram of ammonia? Write your answer in scientific notation, rounding the first factor to the tenths place. (Click $x^{\square}$ to create exponents.)

Question 14:

Each side length of a square is an irrational number.

Which could be the area, in square units, of the square?

a. 1

b. 2

c. 4

d. 9

Question 15:

Earth is approximately 9×10^7 miles from the Sun. Neptune is approximately 3×10^9 miles from the Sun.

Approximately how many times farther from the Sun is Neptune than Earth?

a. 3

b. 30

c. 300

d. 3000