

Grade 8 - Rational and Irrational Numbers - Worksheet

Common Core 8.NS.A.1, 8.NS.A.2 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice rational and irrational numbers, repeating decimals and square root estimates (Common Core 8.NS.A.1 and 8.NS.A.2). Each problem has its own space for work, so print the page and write directly on it.

The problems start with direct skill checks and grow harder as you go. Later items estimate square roots, convert repeating decimals, and solve word problems. Use the answer key afterwards to check every step.

Grade 8 · Common Core State Standards: **8.NS.A.1, 8.NS.A.2**

Exercise 1 - Fraction to decimal

Convert $\frac{7}{16}$ to a decimal.

Exercise 2 - Repeating decimal

Write $\frac{5}{11}$ as a decimal. Use a bar over the repeating digits.

Exercise 3 - Terminating or repeating

Without dividing, tell whether $\frac{7}{20}$ is a terminating or repeating decimal. Then write it as a decimal.

Exercise 4 - Classify numbers

Write R for rational or I for irrational: (a) $\sqrt{49}$ (b) $\sqrt{12}$ (c) $-\frac{3}{5}$ (d) π .

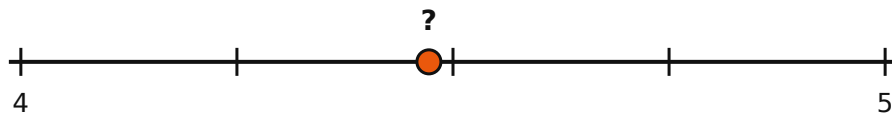
Exercise 5 - Repeating decimal to fraction

A calculator shows the repeating decimal $0.\overline{81}$. Give the fraction in lowest terms.

Exercise 6 - Two-digit repeat

Write $0.\overline{27}$ as a fraction in lowest terms.

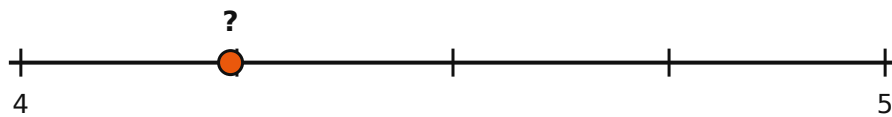
Exercise 7 - Number line estimate



Point ? shows the position of a square root.

Between which two consecutive integers is $\sqrt{20}$? Explain.

Exercise 8 - Round a square root



A mark for the square root of 18.

Estimate $\sqrt{18}$ to the nearest tenth.

Exercise 9 - Compare



The point 5.5 is marked; where is the square root of 30?

Compare $\sqrt{30}$ and 5.5 using $<$, $>$, or $=$.

Exercise 10 - Order from least to greatest

Order from least to greatest: $\sqrt{5}$, 2.3 , $\frac{9}{4}$, 2.2 .

Exercise 11 - Repeating with a head

Express $0.\overline{23}$ as a fraction in lowest terms.

Exercise 12 - Sums of rationals

Is the sum of $0.\overline{3}$ and $0.\overline{6}$ rational? Write both as fractions and add.

Exercise 13 - Pi and its approximations

Is $\frac{22}{7}$ greater than or less than π ? Use $\pi \approx 3.14159$.

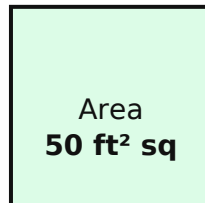
Exercise 14 - Spot the irrational

Which decimal is irrational? Choose and explain: $0.\overline{12}$, 0.125 , or $0.1010010001\dots$ (each time one more 0 between the 1s).

Exercise 15 - Squares and roots

Between which two integers is $-\sqrt{40}$? Then give its approximate value to the nearest tenth.

Exercise 16 - Patio side

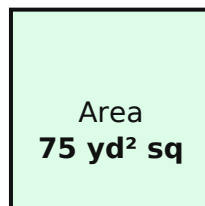


side = ?

Square patio, area 50 square feet.

A square patio at the community center has an area of 50 square feet. Between which two integers is the side length? Give the side to the nearest tenth of a foot.

Exercise 17 - Fence for a garden



side = ?

Sofia's square garden, area 75 square yards.

Sofia fences a square garden of 75 square yards. About how many yards of fence does she need, to the nearest tenth?

Exercise 18 - Board length

Liam's calculator shows a board length of $0.\overline{8}$ yard. Write the length as a fraction of a yard, then find its length in feet.

Exercise 19 - Explain a claim

Jamal says that every decimal that goes on forever is irrational. Is he right? Give an example that supports your answer.

Exercise 20 - Weekly average

Priya runs $\frac{3}{7}$ of a mile each morning. Write this distance as a decimal rounded to the nearest hundredth, and say whether the decimal terminates.