

Grade 8 · Rational and Irrational Numbers · Worksheet

Common Core 8.NS.A.1, 8.NS.A.2 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This worksheet gives 22 problems on rational and irrational numbers for Grade 8, standards 8.NS.A.1 and 8.NS.A.2. The first problems turn fractions into decimals and repeating decimals into fractions.

Next come square root estimates, number line plots and comparisons. The last six problems are word problems and reasoning tasks about garden beds, tile floors and common claims. Show every step.

Grade 8 Common Core: 8.NS.A.1 · 8.NS.A.2

Problem 1: Terminating decimal

Write $\frac{3}{8}$ as a decimal. Tell whether the decimal terminates or repeats.

Problem 2: Repeating decimal

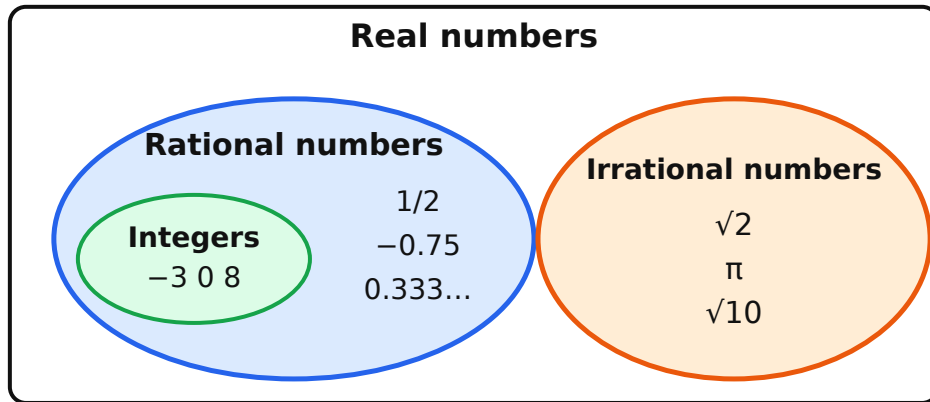
Write $\frac{5}{9}$ as a decimal.

Problem 3: Two-digit repeat

Write $\frac{7}{11}$ as a decimal.

Problem 4: Sort the numbers

Tell whether each number is rational or irrational: $\sqrt{9}$, $\sqrt{10}$, $-\frac{4}{5}$, $0.\overline{12}$, π .



Rational numbers are fractions of integers; irrational numbers are not.

Problem 5: One repeating digit

Write $0.\overline{4}$ as a fraction.

Problem 6: Two repeating digits

Write $0.\overline{45}$ as a fraction in simplest form.

Problem 7: Three repeating digits

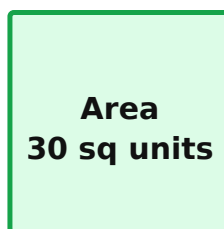
Write $0.\overline{135}$ as a fraction in simplest form.

Problem 8: Delayed repeat

Write $0.1\overline{6}$ as a fraction in simplest form.

Problem 9: Between two integers

Between which two consecutive integers is $\sqrt{30}$?



side = ?

The side of this square is $\sqrt{30}$.

Problem 10: Nearest tenth

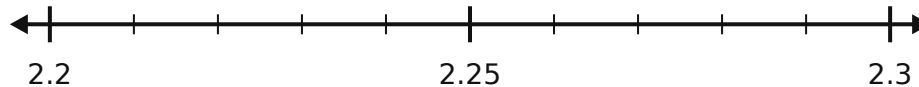
Estimate $\sqrt{50}$ to the nearest tenth.

Problem 11: Square root of 2

Show that $\sqrt{2}$ is between 1.41 and 1.42 by squaring.

Problem 12: Plot the root

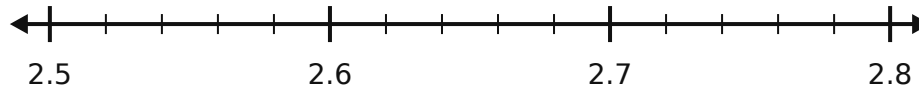
Estimate $\sqrt{5}$ and plot it on the number line.



Each small tick is 0.01.

Problem 13: Compare with a decimal

Compare $\sqrt{7}$ and 2.6 using $<$, $>$ or $=$.



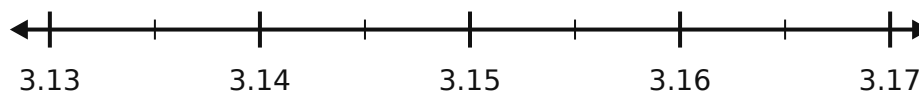
Use the line to check the comparison.

Problem 14: Compare roots

Compare $\sqrt{12}$ and 3.5.

Problem 15: Order four numbers

Write these numbers from least to greatest: π , 3.14, $\frac{22}{7}$, $\sqrt{10}$.



Use decimals to place the numbers.

Problem 16: Rational in between

Name a rational number between $\sqrt{2}$ and $\sqrt{3}$.

Problem 17: Square garden

Maya's square garden bed has an area of 40 square feet. Estimate the side length to the nearest tenth of a foot.



side = ?
Maya's garden bed.

Problem 18: Tile border

Jamal lays a square floor of tiles with an area of 90 square feet. Estimate the side length to the nearest tenth, then estimate the border length around the floor to the nearest foot.

Problem 19: Two lots

Diego's square lot has an area of 45 square yards. Priya's square lot has a side of 6.7 yards. Whose lot is larger? Explain.

Problem 20: Thirds and nines

Write $0.\bar{3}$ and $0.\bar{6}$ as fractions. Add the fractions and explain what the sum shows about $0.\bar{9}$.

Problem 21: Square root claim

Ethan says that $\sqrt{49}$ is irrational because it has a square root sign. Is he right? Explain.

Problem 22: Is $\frac{22}{7}$ equal to π ?

Mei says that $\frac{22}{7}$ is exactly equal to π . Use decimals to show whether she is correct.