

Rational Numbers

Pre-Algebra / Algebra Worksheet · Grade 6–8

Name: _____

Date: _____

Learning Objectives

- Identify and classify rational numbers including integers, fractions, mixed numbers, and improper fractions
- Convert between fractions, mixed numbers, improper fractions, and decimals
- Simplify fractions to their lowest terms and represent integers in fraction form

Problems

1. Which of the following is a rational number? Select all that apply and explain why each qualifies.

4, $\frac{3}{5}$, -7 , $\frac{11}{11}$

2. Write the integer negative 15 in fraction form.

-15

3. Determine whether the fraction shown is already in its simplest (reduced) form. If not, simplify it completely.

$\frac{8}{12}$

4. Classify each number below as a proper fraction, improper fraction, or mixed number.

$\frac{5}{9}$, $\frac{14}{3}$, $3\frac{1}{4}$

5. Convert the mixed number shown into an improper fraction.

$5\frac{3}{4}$

6. Convert the improper fraction shown into a mixed number.

Scan to watch



$$\frac{27}{5}$$

7. Convert the fraction shown into a decimal by first rewriting it as an equivalent fraction over 100.

$$\frac{9}{25}$$

8. Simplify the fraction shown completely, then convert the simplified fraction to a decimal.

$$\frac{15}{60}$$

9. Fill in the table below. For each number given, write its fraction form and its decimal form.

Number	Fraction Form	Decimal Form
-9		
3/4	3/4	
	18/100	0.18
2 and 1/2		

10. A student claims that the mixed number 4 and 3 over 20 is equal to 0.415. Show all steps to convert the mixed number to a decimal and determine whether the student is correct.

$$4\frac{3}{20}$$

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Rational Numbers — Answer Key

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Answer Key

1. Answer: All four are rational numbers

- A rational number is any number that can be written as a fraction p/q where $q \neq 0$.
 - $4 = 4/1$ ✓, $3/5$ is already a fraction ✓, $-7 = -7/1$ ✓, $11/11 = 1 = 1/1$ ✓
 - All four are rational numbers.
-

2. Answer: -15/1

- Any integer can be written as a fraction by placing it over a denominator of 1.
 - $-15 = -15/1$
-

3. Answer: 2/3

- Factor the numerator and denominator: $8 = 2 \times 4 = 2 \times 2 \times 2$ and $12 = 2 \times 6 = 2 \times 2 \times 3$.
 - The GCF of 8 and 12 is 4.
 - Divide both by 4: $8 \div 4 = 2$ and $12 \div 4 = 3$.
 - The simplified fraction is $2/3$.
-

4. Answer: 5/9 = proper fraction; 14/3 = improper fraction; 3 and 1/4 = mixed number

- A proper fraction has a numerator smaller than the denominator: $5/9$ ✓ ($5 < 9$).
 - An improper fraction has a numerator greater than or equal to the denominator: $14/3$ ✓ ($14 > 3$).
 - A mixed number combines a whole number and a proper fraction: 3 and $1/4$ ✓.
-

5. Answer: 23/4

- Multiply the whole number by the denominator: $5 \times 4 = 20$.
 - Add the numerator: $20 + 3 = 23$.
 - Place the result over the original denominator: $23/4$.
-

6. Answer: 5 and 2/5

- Divide the numerator by the denominator: $27 \div 5 = 5$ remainder 2.
 - The whole number part is 5 and the remainder becomes the new numerator.
 - The mixed number is 5 and $2/5$.
-

7. Answer: 0.36

- Find the factor needed to turn 25 into 100: $25 \times 4 = 100$.
 - Multiply both numerator and denominator by 4: $(9 \times 4)/(25 \times 4) = 36/100$.
 - 36 per 100 means 0.36 — move the decimal two places to the left.
 - $9/25 = 0.36$.
-

8. Answer: 1/4 = 0.25

- Find the GCF of 15 and 60: GCF = 15.
- Divide both by 15: $15/15 = 1$ and $60/15 = 4$, giving $1/4$.

Scan to watch



- To convert $\frac{1}{4}$ to a decimal, multiply numerator and denominator by 25: $(1 \times 25) / (4 \times 25) = 25/100$.
- $25/100 = 0.25$.

9. Answer: See completed table

Number	Fraction Form	Decimal Form
-9	$-9/1$	-9.0
$\frac{3}{4}$	$\frac{3}{4}$	0.75
$\frac{18}{100}$	$\frac{18}{100}$	0.18
2 and $\frac{1}{2}$	$\frac{5}{2}$	2.5

- -9 in fraction form: $-9/1$; as a decimal: -9.0.
- $\frac{3}{4}$: multiply by $\frac{25}{25} \rightarrow \frac{75}{100} = 0.75$.
- $\frac{18}{100} = 0.18$; the original number is $\frac{18}{100}$.
- 2 and $\frac{1}{2}$: improper fraction = $(2 \times 2 + 1) / 2 = \frac{5}{2}$; as a decimal: $5 \div 2 = 2.5$.

10. Answer: 4.15; the student is incorrect

- First convert to an improper fraction: $(4 \times 20 + 3) / 20 = (80 + 3) / 20 = \frac{83}{20}$.
- Next, convert the fractional part $\frac{3}{20}$ to a decimal: multiply by $\frac{5}{5}$ to get $\frac{15}{100} = 0.15$.
- Add the whole number part: $4 + 0.15 = 4.15$.
- The student wrote 0.415, which is incorrect. The correct decimal is 4.15.

