

Today's lesson is on fractions and decimals. We will be converting between fractions and decimals, working with terminating decimals, and working with repeating decimals.

Gather your clicker, your notebook and your pencil.

Get ready to log in your clicker, and to work out some warm-up problems.



Solve: $-89 + 23$

Copy the problem, work it out, then text in your answer.



Solve: $33 - (-11)$

Remember to use your rules for subtracting integers.



Solve: $-88 \div 22$

Work it out, text in answer.



Solve: $3(-11)$

Text in your answer now please.



Solve: $-45 \div (-15)$

Text in your response please.

Fractions and Decimals

What You'll Learn

To convert between fractions and decimals

🔊 **New Vocabulary** terminating decimal, repeating decimal

Why Learn This?

When you order sandwich meat at a delicatessen, you may ask for half a pound. The scales at a deli often use decimal measures. You can convert between fractions and decimals to make sure you are receiving the correct amount.



You write a fraction as a decimal by dividing the numerator by the denominator. A decimal that stops, or terminates, is a **terminating decimal**.

EXAMPLE Writing a Terminating Decimal

- 1 **Gridded Response** The pull of gravity is weaker on the moon than on Earth. The fraction $\frac{4}{25}$ represents the ratio of the moon's gravity to Earth's gravity. Write this fraction as a decimal.

$$\begin{array}{r} \frac{4}{25} \text{ or } 4 \div 25 = \begin{array}{r} 0.16 \\ \underline{25} 4.00 \\ -25 \\ \hline 150 \\ -150 \\ \hline 0 \end{array} \leftarrow \text{quotient} \\ \leftarrow \text{The remainder is 0.} \end{array}$$

The ratio of the moon's gravity to Earth's gravity as a decimal is 0.16. This is a terminating decimal because the division process stops when the remainder is 0.

- 1 **EXAMPLE** The total amount of rainfall yesterday was reported as $\frac{1}{4}$ in. Express the amount of rainfall as a decimal.

$$\begin{array}{r} \frac{1}{4} \text{ or } 1 \div 4 = \begin{array}{r} 0.25 \\ \underline{4} 1.00 \\ -8 \\ \hline 20 \\ -20 \\ \hline 0 \end{array} \leftarrow \text{quotient} \\ \leftarrow \text{The remainder is 0.} \end{array}$$

So, $\frac{1}{4} = 0.25$. The total amount of rainfall was 0.25 in.



The fraction of nitrogen in a chemical sample is found to be $\frac{5}{8}$. Write this fraction as a decimal.

Write it down and work out the long division problem until you get to zero, then text in your answer.

Vocabulary Tip

The symbol for a repeating decimal is a bar over the repeated digit(s), for example, $0.\overline{17}$.

If the same block of digits in a decimal repeats without end, the decimal is a **repeating decimal**. The repeating block can include one or more digits.

$$5.35555555555 \dots = 5.3\overline{5} \quad \leftarrow \text{The digit 5 repeats.}$$

$$0.171717171717 \dots = 0.\overline{17} \quad \leftarrow \text{The digits 17 repeat.}$$

EXAMPLE Writing a Repeating Decimal

2 Write $\frac{3}{11}$ as a decimal.

Method 1 Paper and Pencil

$$\frac{3}{11} \text{ or } 3 \div 11 = 11 \overline{)3.00000}$$

$$\begin{array}{r} 0.27272 \\ -22 \\ \hline 80 \\ -77 \\ \hline 30 \\ -22 \\ \hline 80 \\ -77 \\ \hline 30 \end{array}$$

\leftarrow The digits 27 repeat.

\leftarrow There will always be a remainder of 30 or 80.

2 **EXAMPLE** Write $\frac{7}{15}$ as a decimal.

$$\frac{7}{15} \text{ or } 7 \div 15 = 15 \overline{)7.0000}$$

$$\begin{array}{r} 0.4666 \\ -60 \\ \hline 100 \\ -90 \\ \hline 100 \\ -90 \\ \hline 10 \end{array}$$

\leftarrow The digit "6" repeats.

\leftarrow There will always be a remainder.

So, $\frac{7}{15} = 0.4\overline{6}$.

Work this problem out and then table talk to come to an agreement on an answer.

Quick Check

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



You can write a terminating decimal as a fraction or a mixed number by writing the digits to the right of the decimal point as a fraction.

EXAMPLE Writing a Decimal as a Fraction

- 3 Write 1.325 as a mixed number with a fraction in simplest form.

$$\text{Since } 0.325 = \frac{325}{1,000}, 1.325 = 1\frac{325}{1,000}.$$

$$\begin{aligned} 1\frac{325}{1,000} &= 1\frac{325 \div 25}{1,000 \div 25} \quad \leftarrow \text{Use the GCF to write the fraction in simplest form.} \\ &= 1\frac{13}{40} \end{aligned}$$

- 3 **EXAMPLE** Write 4.105 as a fraction in simplest form.

$$\text{Since } 0.105 = \frac{105}{1,000}, 4.105 = 4\frac{105}{1,000}.$$

$$4\frac{105}{1,000} = 4\frac{105 \div 5}{1,000 \div 5} \quad \leftarrow \text{Use the GCF to write the fraction in simplest form.}$$

$$= 4\frac{21}{200}$$



Write 1.364 as a mixed number or fraction in simplest form

(A) $91/240$

(B) $3 \frac{16}{25}$

(C) $1 \frac{91}{250}$

(D) $16/25$



Write 2.48 as a mixed number or fraction in simplest form.

(A) $2 \frac{4}{5}$

(B) $2 \frac{212}{25}$

(C) $4 \frac{4}{5}$

(D) $2 \frac{12}{25}$



Write 3.6 as a mixed number in simplest form.

(A) $11/5$

(B) $3 \frac{3}{5}$

(C) $18/5$

(D) $3 \frac{3}{50}$

Power down your clickers and put them away

Take out a piece of notebook paper and write your name and class period on the top, then copy down the 2 problems I am assigning you for homework.

1. Change $\frac{7}{40}$ into a decimal (show all of your work)
2. Change 0.625 into a fraction in simplest form.

Due tomorrow.