

Accelerated Math Notes  
Lesson 3.1  
Fractions and Decimals

The decimal form of a fraction is either

\***terminating** If the remainder eventually becomes zero when you divide, the decimal is terminating.

OR .17 .5

\***repeating** If the decimal has one or more digits that repeat, it can be written using bar notation.

Bar Notation:  $0.92222... = 0.9\bar{2}$   
 $0.25\bar{6} = 0.256256256...$

$.67 = \frac{67}{100}$

$\frac{1}{5} = \frac{2}{10}$

A fraction is a division problem.

Any fraction can be expressed as a decimal by dividing the numerator by the denominator.

$\frac{5}{12}$   
 $12 \overline{) 5.000}$

0.41 $\bar{6}$

$\frac{3}{8}$   
 $8 \overline{) 3.000}$   
24  
60  
56  
40  
40

0.375

To find the decimal for a fraction, without using a calculator, ask yourself these questions:

Is it a fraction I have memorized?

$\frac{1}{2} = .5$	$\frac{1}{5} = .2$	$\frac{1}{6} = .1\bar{6}$
$\frac{1}{3} = .\bar{3}$	$\frac{2}{5} = .4$	$\frac{2}{6} = \frac{1}{3} = 0.\bar{3}$
$\frac{2}{3} = .\bar{6}$	$\frac{3}{5} = .6$	$\frac{3}{6} = \frac{1}{2} = 0.5$
$\frac{1}{4} = .25$	$\frac{4}{5} = .8$	$\frac{4}{6} = \frac{2}{3} = 0.\bar{6}$
$\frac{3}{4} = .75$		$\frac{5}{6} = 0.8\bar{3}$

$\frac{10}{10} = .9$

(cont.) Fraction/Decimal Relationships to MEMORIZE:

$\frac{1}{8} = .125$	$\frac{1}{10} = .1$	$\frac{1}{10} = .1$
$\frac{2}{8} = \frac{1}{4} = .250$	$\frac{2}{10} = .2$	$\frac{2}{10} = .2$
$\frac{3}{8} = .375$	$\frac{3}{10} = .3$	$\frac{3}{10} = .3$
$\frac{4}{8} = \frac{1}{2} = .5$	$\frac{4}{10} = .4$	$\frac{4}{10} = .4$
$\frac{5}{8} = .625$	$\frac{5}{10} = .5$	$\frac{5}{10} = .5$
$\frac{6}{8} = \frac{3}{4} = .75$	$\frac{6}{10} = .6$	$\frac{6}{10} = .6$
$\frac{7}{8} = .875$	$\frac{7}{10} = .7$	$\frac{7}{10} = .7$
$\frac{8}{8} = 1$	$\frac{8}{10} = .8$	$\frac{8}{10} = .8$
	$\frac{9}{10} = .9$	$\frac{9}{10} = .9$

No Brainer

Does it have a denominator that is a power of ten (10,100,1000...)?

Think... Read the fraction and use place value.

$\frac{7}{100}$  "seven hundredths" 0. \_\_\_ = .07  
 $\frac{7}{1000} = 0.007$

Can the fraction easily be rewritten with a denominator of 10, 100, 1000, ...?

Think... Rewrite it with a new denominator.

$\frac{7}{20} = \frac{35}{100}$  (.35)  
 $\frac{11}{25} = \frac{44}{100}$  (.44)  
 $\frac{3}{50} = \frac{6}{100}$  (.06)

Can the fraction be simplified first and THEN answer one of these questions?

Find the decimal for each of these fractions:

$\frac{7}{14} = \frac{1}{2} = .5$        $\frac{36}{81} = \frac{4}{9} = 0.\bar{4}$   
 $\frac{9}{45} = \frac{1}{5} = .2$        $\frac{6}{8} = \frac{3}{4} = .75$   
 $\frac{3}{12} = \frac{1}{4} = .25$        $\frac{24}{60} = \frac{2}{5} = .4$

Last Resort...Do long division!

$\frac{\text{numerator}}{\text{denominator}} \rightarrow \text{denominator} \overline{) \text{numerator}}$

$\frac{7}{11}$

$\frac{5}{18}$

We may need to change mixed numbers or negative numbers to decimals.

Examples:

$-2\frac{1}{4}$

$-\frac{7}{9}$

$8\frac{3}{20}$