

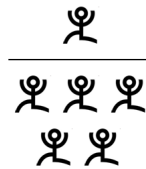
Feb. 22, 2016

Unit 5

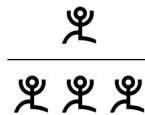
Percent, Ratio, and Rate



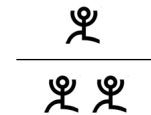
Social Security: Worker to Beneficiary Ratio



1960: 5.1 to 1



2009: 3.0 to 1



2030: 2.2 to 1

Source: Social Security Administration Trustees Report Table IV B2
Ratio of covered workers to beneficiaries

Percent to Decimal

- divide the percent by 100

$$\frac{34}{100} \leftarrow \div$$

$$34\% = 0.34$$

because $34 / 100 =$

$$34\%$$

more decimal
2 places to
the left
(move digit
2 places to the
right)

Decimal to Percent

- multiply by 100

(move decimal 2 place to the right)

$$0.2 = 20\%$$

because $0.2 \times 100 =$

$$0.378 = 37.8\%$$

because

Decimal to Fraction

-Place values help

* the place value is the denominator

* NO decimals in fractions

-Always reduce

$$0.125 = \frac{125}{1000} \xrightarrow{\div 125} \frac{1}{8}$$

ends in the
thousandths
my denominator
is 1000

Fraction to Decimal

-Divide top number by bottom number on a calculator

$$\frac{2}{7} = 2 \div 7 = 0.285714$$

- Some fractions you can write as equivalent fractions with denominator of 100

$$\frac{7}{20} \xrightarrow{\times 5} \frac{35}{100} = 0.35$$

$$\frac{725}{10000} = 0.0725$$

Percent to Fraction

-Whole number put over 100

$$26\% = \frac{26}{100} \xrightarrow{\div 2} \frac{13}{50}$$

- NO Decimals in fractions so write equivalent fractions

$$12.5\% =$$

$$\frac{12.5 \times 10}{100 \times 10}$$

$$= \frac{125}{1000} \xrightarrow{\div 5} \frac{25}{200} \xrightarrow{\div 5} \frac{5}{40} \xrightarrow{\div 5} \frac{1}{8}$$

0.125
thousandths
place

is Not
a fraction

Relating Fractions, Decimals and Percent

What is percent?

*

Percent is a special ratio where the second term is always 100 or it is out of 100.

How do you change a percent to a decimal or fraction?

Percent	Reduce Fraction	Decimal
18%	$\frac{18 \div 2}{100 \div 2} = \frac{9}{50}$	0.18
75%	$\frac{3 \times 25}{4 \times 25} \frac{3}{4} = \frac{75}{100}$	0.75
45%	$\frac{45 \div 5}{100 \div 5} = \frac{9}{20}$	0.45
35%	$\frac{7 \times 5}{20 \times 5} \frac{7}{20} = \frac{35}{100}$	0.35
83%	$\frac{83}{100}$	0.83
$\approx 55\%$	* $\frac{5}{9}$	$0.\overline{5}$

% to Decimal
 $\div 100$

$$\frac{1}{9} = 0.\overline{1}$$

$$\frac{2}{9} = 0.2$$

$$\frac{3}{9} = \frac{1}{3} = 0.\overline{3}$$

$$\frac{1}{9} = 0.\overline{1}$$

$$\frac{2}{9} = 0.\overline{2}$$

$$\frac{3}{9} = \frac{1}{3} = 0.\overline{3}$$

$$\frac{4}{9} = 0.\overline{4}$$

$$\frac{5}{9} = 0.5$$

$$\frac{6 \div 3}{9 \div 3} = \frac{2}{3} = 0.\overline{6}$$

$$\frac{7}{9} = 0.\overline{7}$$

$$\frac{8}{9} = 0.\overline{8}$$

Think test results

What is the decimal value? the percentage?

$$\frac{62}{82} = 0.\overline{75609} \approx 75.6\%$$

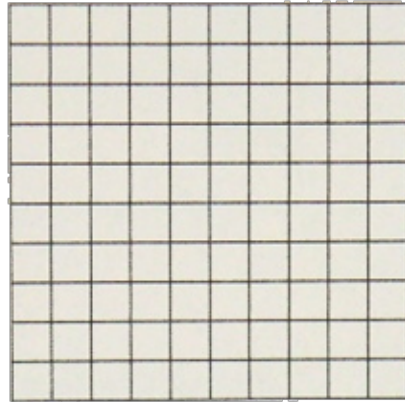
$$\approx 76\%$$

On calculator

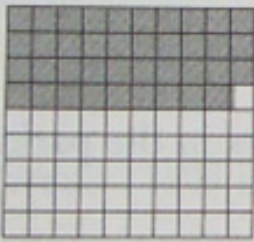
top \div Bottom

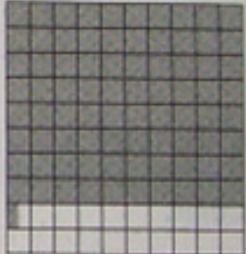
$$0.756 = 75.6\%$$

We can use a hundred chart to represent one whole or 100%. Each small square represents 1%.



Each hundred chart represents 100%. What fraction is shaded? Write each fraction as a decimal and as a percent.

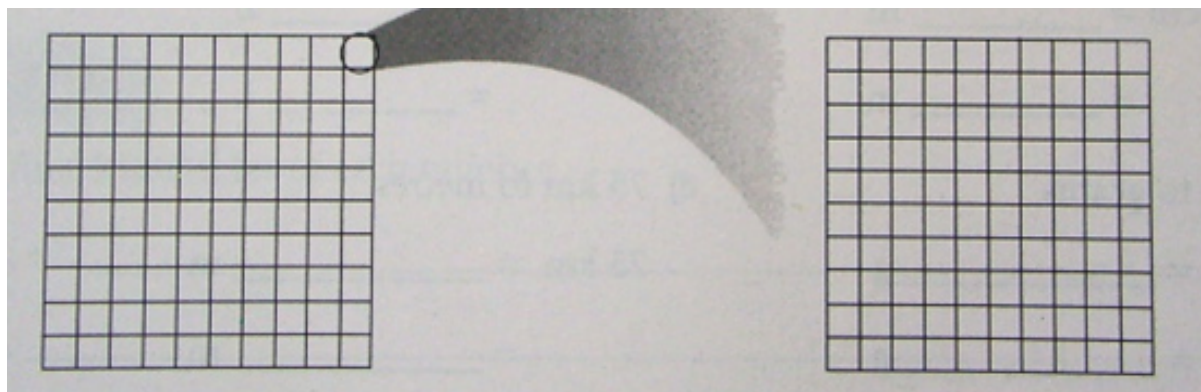
a)  39%
 $\frac{39}{100}$
 0.39

b) 

$$\frac{80.5 \times 10}{100} \times 10 \rightarrow \frac{805 \div 5}{1000 \div 5} = \frac{161}{200}$$

80.5%
 0.805

One small square on a hundred chart can be enlarged to show 100 squares. This is called a hundredths chart.



Each small square of a hundredths chart represents $\frac{1}{100}$ of 1%, or $\frac{1}{100}$ %, or 0.01%



Percent to decimal remember to divide by 100

Be careful not to confused a
decimal percent to a decimal

\uparrow 0.2% is 0.002 as a decimal
by 100

\uparrow 0.007% = 0.00007 as a decimal

Write each percent as a fraction and a decimal:

(a) 7% *Fraction* *Decimal*
 $\frac{7}{100}$ 0.07

$0.07\% \div 100 = 0.07$

(b) 7.75% *0.0775 decimal* *ten thousandths place*
 $\frac{7.75 \times 100}{100 \times 100} = \frac{775}{10000}$ *Reduce*
 $\frac{775 \div 25}{10000 \div 25} = \frac{31}{400}$

(c) 7 1/4 % *Decimal*
 $7\frac{1}{4}\% = 7.25\%$ 0.0725 *ends in ten thousandths*
 $\frac{725}{10000} = \frac{145}{2000} = \frac{29}{400}$

Write each fraction as a decimal and as a percent:

(a) $\frac{5}{8} \times \frac{125}{125} = \frac{625}{1000} = 0.\underline{6}\underline{2}\underline{5}$

(b) $\frac{5}{6} \text{ on cal } = 62.5\%$
 $\frac{5}{6} \text{ on cal } = 0.8\bar{3}$
 $= 83.3\%$

(c) $\frac{5}{1000} = \frac{1}{200}$
 $= 0.5\%$
 $= 0.005$

Buffy had $23\frac{1}{2}$ out of 30 on her math test

She had $21\frac{1}{2}$ out of 40 on her second math test

On which test did Buffy do better?

Use calculators

$$\frac{23.5}{30} = 78.3\% \\ = 0.78\bar{3}$$

$$\frac{21.5}{40} = 53.75\% \\ = 0.5375$$

Top ÷ Bot

Class/Homework

Practice Questions

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