

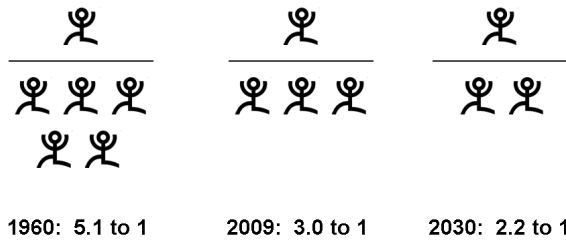
Feb. 7, 2017

Unit 5

Percent, Ratio, and Rate



Social Security: Worker to Beneficiary Ratio



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

Need to Study

Percent to Decimal

$$34\% = 0.34$$

because $34 / 100 =$

- divide the percent by 100

↳ move decimal left 2 places
 ↳ move digit 2 places right

Decimal to Percent

$$0.2 = 20\%$$

because $0.2 \times 100 =$

$$0.378 = 37.8\%$$

because

- multiply by 100

↳ move decimal place 2 places to right
 (move digit 2 places to left)

Decimal to Fraction

- Place values help

0.125 =
 decimal ends in the thousandths

$$\frac{125}{1000} = \frac{5}{40} = \frac{1}{8}$$

* the place value where the decimal stops is the denominator

* NO decimals in fractions (Numerator is the number without the decimal)

- Always reduce

Always Reduce Fraction

Fraction to Decimal

- Divide top number by bottom number on a calculator

$$\frac{2}{7} = 0.285714285 \approx 28.6\%$$

- Some fractions you can write as equivalent fractions with denominator of 10, 100 or 1000

$$\frac{7}{20} = \frac{35}{100} = 0.35 = 35\%$$

Percent to Fraction

- Whole number put over 100

$$26\% = \frac{26}{100} = \frac{13}{50}$$

- NO Decimals in fractions so write equivalent fractions

$$12.5\% =$$

Method 1)

take to decimal first
 ↳ ÷ by 100

$$= 0.125$$

Decimal → fraction (place value)

$$\frac{125}{1000} = \frac{1}{8}$$

Method 2) Not a proper fraction

$$\frac{12.5 \times 10}{100 \times 10} = \frac{125}{1000} = \frac{1}{8}$$

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?

% to Decimal
÷ 100

Percent	Reduce Fraction	Decimal
18%	$\frac{18}{100} = \frac{9}{50}$	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%	$\frac{7}{20} = \frac{7 \times 5}{20 \times 5} = \frac{35}{100}$	0.35
83%	$\frac{83}{100}$	0.83
55%	$\frac{5}{9}$	0.55

$\frac{1}{9} = 0.\overline{1}$
 $\frac{2}{9} = 0.\overline{2}$
 $\frac{3}{9} = 0.\overline{3}$
 \vdots
 $\frac{5}{9} = 0.\overline{5}$

Think of test results

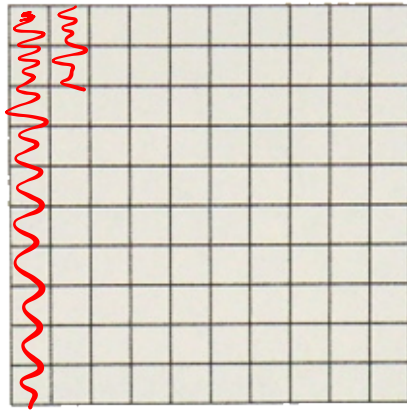
What is the decimal value? the percentage?

$$\frac{62}{82} = 0.75609 \Rightarrow 75.6\%$$

Fraction \rightarrow decimal $\xrightarrow{\times 100}$ Percent
 \hookrightarrow top \div bottom

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

12%



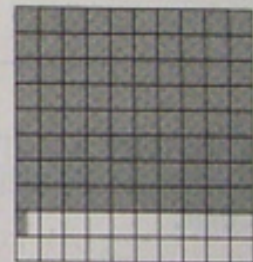
Each hundred chart represents 100%. What fraction is shaded?
Write each fraction as a decimal and as a percent.

a)



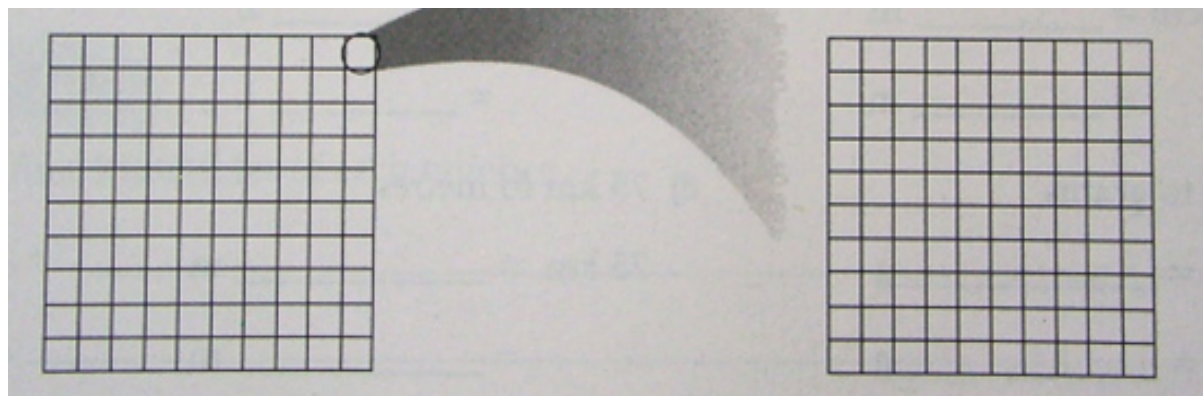
37%

b)



80.5%

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

\div by 100 to get decimal

0.2% is 0.002 as a decimal

0.007% = 0.00007 as a decimal

0.02 %

Write each percent as a fraction and a decimal:

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

(b) 7.75%
 $\% \text{ to decimal} \Rightarrow \div \text{by } 100$
 \uparrow 775% 0.0775 $\frac{775 \div 25}{10000 \div 25} = \frac{31}{400}$

(c) $7\frac{1}{4}\%$
 \downarrow
 $7.25\% \Rightarrow 0.0725$ $\frac{725 \div 25}{10000 \div 25} = \frac{29}{400}$

Write each fraction as a decimal and as a percent:

(a) $\frac{5}{8} \times \frac{125}{125} = \frac{625}{1000} = 0.625 \xrightarrow{\times 100 \text{ to get } \%} 62.5\%$

(b) $\frac{5}{6}$
 $5 \div 6 = 0.8\bar{3} = 83.\bar{3}\%$

(c) $\frac{5}{1000} = 0.005 = 0.5\%$
 \uparrow
 to get %
 $\times \text{ by } 100$

Class/Homework

Practice Questions

Page 239 #3, 6(b,c), 7(a,c)

Page 240 #8, 9(a,c), 12(b,d), 13(a,c), 14(b,c), 16

3) $\frac{1}{5}$ Fraction $\frac{1}{5}\%$ Percent

$\frac{1}{5} = \frac{2}{10}$ 0.2%
↓
 0.2 decimal 0.002 as a decimal

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