

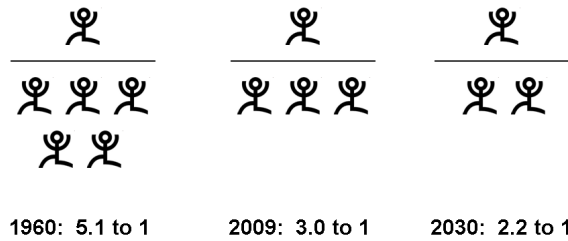
Feb. 10, 2020

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

Percent to Decimal

34% = 0.34
because 34 / 100 =

- divide the percent by 100
→ move decimal 2 places left

Decimal to Percent

0.2 = 20%
because 0.2 x 100 =

0.378 = 37.8%
because

- multiply by 100
move decimal 2 places to the Right

Decimal to Fraction

- Place values help
 - * the place value is the denominator
 - * NO decimals in fractions
- Always reduce

0.125 = $\frac{125 \div 125}{1000 \div 125} = \frac{1}{8}$
 * thousands stops in

Fraction to Decimal

Study

-Divide top number by bottom number on a calculator

$\frac{2}{7} = 2 \div 7 = 0.2857$

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

$\frac{7}{20} = \frac{35}{100} = 0.35 = 35\%$
 (Note: 7 x 5 = 35, 20 x 5 = 100)

Percent to Fraction

-Whole number put over 100

26% = $\frac{26}{100} = \frac{13}{50}$ (Reduce)

- NO Decimals in fractions so write equivalent fractions

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

% to Decimal
÷ 100

Percent %	Reduce Fraction <u>frac</u>	Decimal
a 18%	$\frac{18}{100} \stackrel{\div 2}{=} \frac{9}{50}$	0.18
b 75%	$\frac{75}{100} \stackrel{\div 25}{=} \frac{3}{4}$	0.75
c 45%	$\frac{45}{100} = \frac{9}{20}$	0.45
d 35%	$\frac{35}{100} = \frac{7}{20}$	0.35
e 83%	$\frac{83}{100}$	0.83
f 55.5%	$\frac{5}{9} = 5/9$	0.555...

$\frac{1}{9} = 0.\overline{1}$
 $\frac{2}{9} = 0.2\overline{2}$
 $\frac{3}{9} = \frac{1}{3} = 0.3\overline{3}$

Think test results

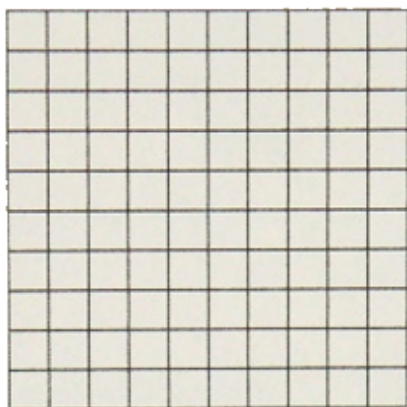
What is the decimal value? the percentage?

$$\frac{62}{82} \leftarrow \text{divide}$$

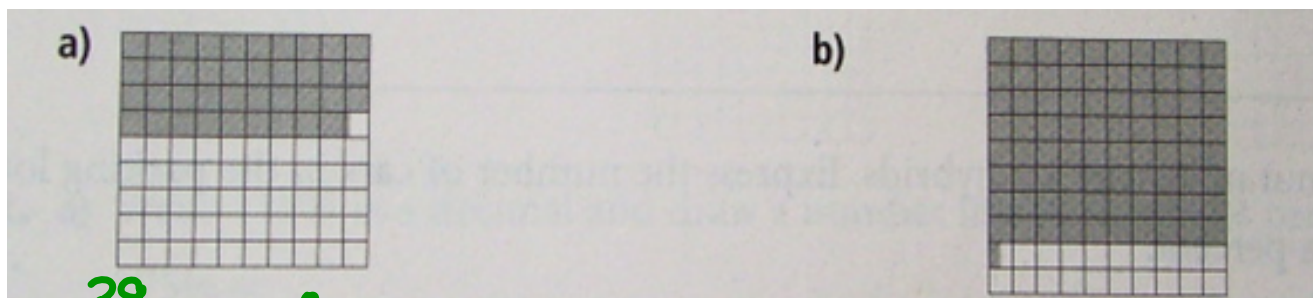
$$62 \div 82 = 0.75609 \quad \times 100 \approx 76\%$$

{
decimal

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



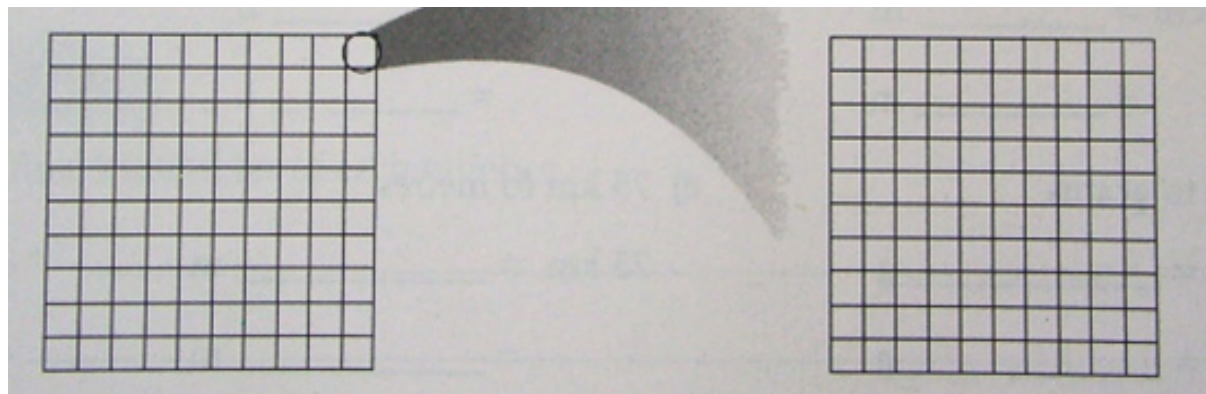
Each hundred chart represents 100%. What fraction is shaded?
Write each fraction as a decimal and as a percent.



$$\frac{39}{100} = 39\%$$
$$0.39$$

$$80.5\%$$
$$\frac{\cancel{80.5}}{\cancel{100}} = \frac{805}{1000}$$

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

0.2% is 0.002 as a decimal

0.007% = as a decimal

Write each percent as a fraction and a decimal:

(a) 7% % to fraction

$$\frac{7}{100} \quad 0.\underline{0}7$$

(b) 7.75%

$$\frac{7.75}{100} \times 100 = \frac{775}{10000} \div 25 = \frac{31}{400} \quad 0.\underline{0}775$$

Not frac

(c) 7 1/4 %

$$7.25\% \quad \frac{725}{10000} = \frac{29}{400} \quad 0.0725$$

$$\frac{725}{100} \text{ Not frac}$$

Write each fraction as a decimal and as a percent:

(a) $\frac{5}{8}$

$$\frac{5}{8} \xrightarrow{\times 125} \frac{625}{1000} = 0.625 \quad 62.5\%$$

or $5 \div 8$

$\xrightarrow{\times 125}$

(b) $\frac{5}{6}$

$$5 \div 6 \quad 0.8\overline{33} \quad 83.\overline{3}\%$$

(c) $\frac{5}{1000}$

$$= 0.\underline{00}5 \quad \boxed{0.5\%}$$