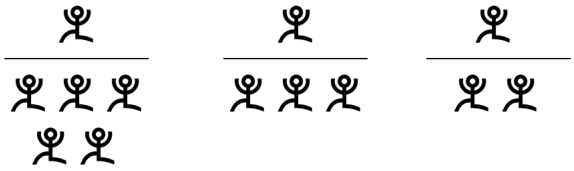
Feb. 20, 2017

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

34% = 0.34 because 34 / 100 =

52% = 0.52

Decimal to Percent

- multiply by 100

0.2 = 20 % because 0.2 x 100 =

0.378 = 37.8 % because 0.378 x100

Decimal to Fraction

-Place values help

* the place value is the denominator
* NO decimals in fractions

-Always reduce

0.125 = stopped in thousandths $\frac{125 \div 25}{1000 \div 25} = \frac{5 \div 5}{40 \div 5} = \frac{1}{8}$

Fraction to Decimal

-Divide top number by bottom number on a calculator

$\frac{2}{7} = 0.285$

$= 28.5\%$

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

$\frac{7}{20} = \frac{35}{100} = 0.35$ (x5 / x5)

Percent to Fraction

-Whole number put over 100

$26\% = \frac{26}{100} \overset{\text{Reduce}}{=} \frac{13}{50}$

- NO Decimals in fractions so write equivalent fractions

$12.5\% = \frac{12.5}{100}$ (x10 / x10) not a fraction

$= \frac{125}{1000}$

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%	$\frac{18}{100} \overset{\div 2}{=} \frac{9}{50}$ $\div 2$	18% ÷ 100 = 0.18
75 %	$\frac{3}{4} \overset{\times 25}{=} \frac{75}{100}$ $\times 25$ 3/4	0.75
0.45 × 100 45 %	$\frac{45}{100} \overset{\div 5}{=} \frac{9}{20}$ $\div 5$	0.45
35%	$\frac{7}{20} \overset{\times 5}{=} \frac{35}{100}$ $\times 5$ 7/20	0.35
83%	$\frac{83}{100}$	0.83
$55.\overline{5}$ %	5/9	$0.\overline{55}$

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

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

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

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

$\frac{5}{9} = 0.\overline{5}$

Think test results

What is the decimal value? the percentage?

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

decimal

$\times 100 \Rightarrow$

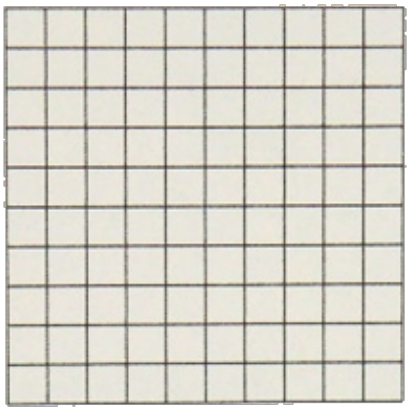
%

75.609 %

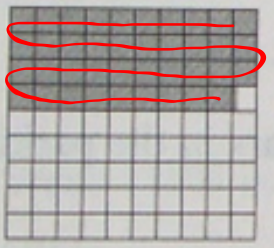
$\approx$ 76 %

62 ÷ 82

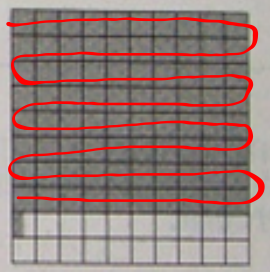
We can use a hundred chart to represent one whole or 100%.
Each small square represents 1%.



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

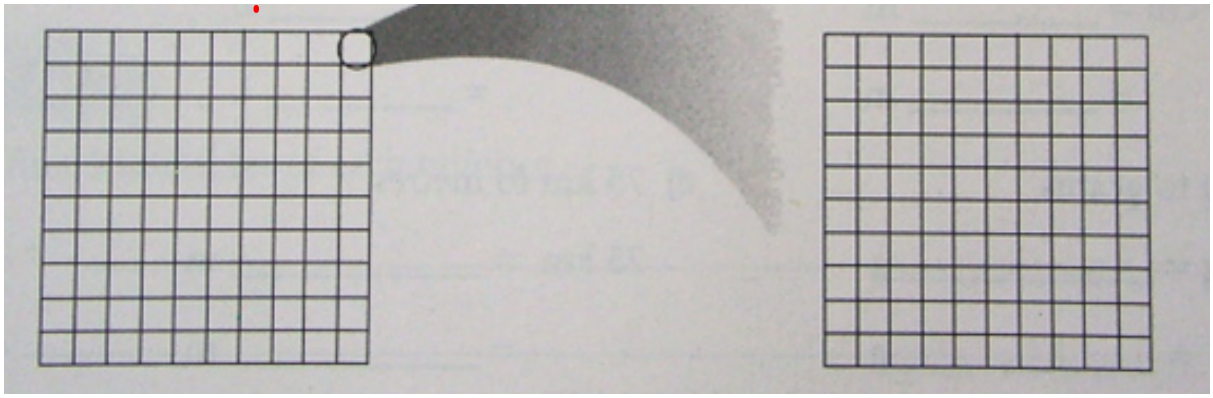
a) 

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

b) 

$\frac{80.5}{100} = 80.5\%$

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

this is a percent

0.2% is 0.002 as a decimal

0.007% = 0.00007 as a decimal

% ÷ 100

Write each percent as a fraction and a decimal:

(a) 7%

Decimal
7% ÷ 100
0.07

Fraction
$\frac{7}{100}$

(b) 7.75%

7.75% ÷ 100
0.0775

$\frac{7.75 \times 100}{100 \times 100} = \frac{775 \div 25}{10000 \div 25} = \frac{31}{400}$

(c) 7 1/4 %

$7\frac{1}{4}\%$

7.25%

7.25% ÷ 100
0.0725

$\frac{725 \div 25}{10000 \div 25} = \frac{29}{400}$

Write each fraction as a decimal and as a percent:

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

Decimal
5 ÷ 8
= 0.625

Percent
62.5%

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

$0.8\overline{3}$

$83.\overline{3}\%$

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

0.005

0.5%

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

Test 1)

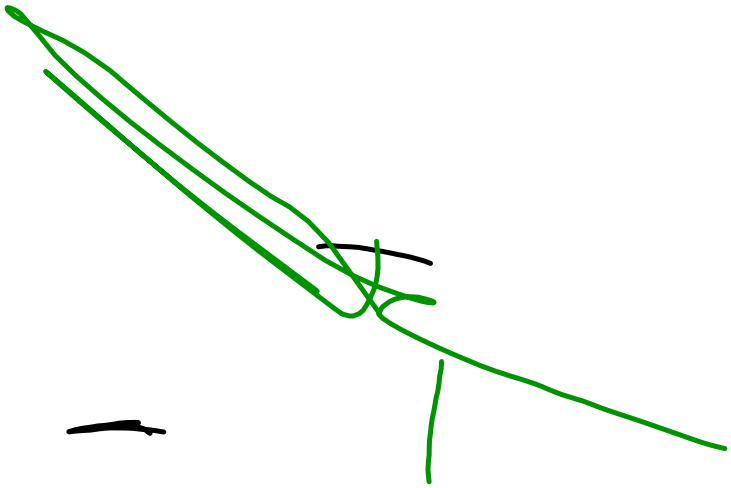
$\frac{23.5}{30}$ Top ÷ Bottom $\frac{235}{300}$ = decimal $0.78\overline{3} \Rightarrow 78.\overline{3}\%$

Test 2)

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

Test 1 Buffy did better on.

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