Number Revision

Standard form:

Which of these numbers are written in standard form?

two hundred and four

2.3×10

32×10

62×10^{6}

4.7×10^{4}

6.9×10^{-2}

0.76×10^{7}

What does 10^{-2} mean?

Write these numbers in standard form...

10^{-2}

$10^{0} = 1$

$10^{-1} = 0.1$

$10^{-2} = 0.01$

2600 $= 2.6 \times 10^{3}$

740 $= 7.4 \times 10^{2}$

342 $= 3.42 \times 10^{2}$

0.3 $= 3 \times 10^{-1}$

4 $= 4 \times 10^{0}$

0.00456 $= 4.56 \times 10^{-3}$

9 million $= 9 \times 10^{6}$

Without a calculator work out:

1) $3.6 \times 10^{5} + 2.7 \times 10^{3}$

2) $2.4 \times 10^{4} \times 5 \times 10^{-5}$

$= 12 \times 10^{-1}$

$= 1.2 \times 10^{0}$

$360\,00$

$\quad 2700$

$362700 = 3.627 \times 10^{5}$

Now work them out with a calculator and see how it displays the answers.

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Work out:

Find $\frac{4}{15}$ of 60

$\frac{4}{15} \times 60$

60

$\frac{5}{6} = 50$

$\frac{2}{3} = 40$

$\frac{4}{15} = 16$

$\frac{9}{20} = 27$

$\frac{2}{5} = 24$

$\frac{1}{2} = 30$

$\frac{3}{4} = 45$

$\frac{3}{30} = 6$

$\frac{7}{10} = 42$

$\frac{3}{4} + \frac{6}{7}$

$= \frac{21}{28} + \frac{24}{28} = \frac{45}{28} = 1\frac{17}{28}$

$\frac{3}{4} \div \frac{6}{7}$

$\frac{3}{4} \times \frac{7}{6} = \frac{21}{24} = \frac{7}{8}$

$\frac{3}{4} \times \frac{6}{7} = \frac{18}{28} = \frac{9}{14}$

$\frac{8}{9} - \frac{6}{7} = \frac{56}{63} - \frac{54}{63} = \frac{2}{63}$

Express

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a) 5/7 as a decimal to 3dp

b) 0.67 as a fraction

c) 0.434343..as a fraction.

$7 \overline{) 5.0000}$ = 0.7143

0.714

b) $\frac{67}{100}$

c) Let $x = 0.4343...$

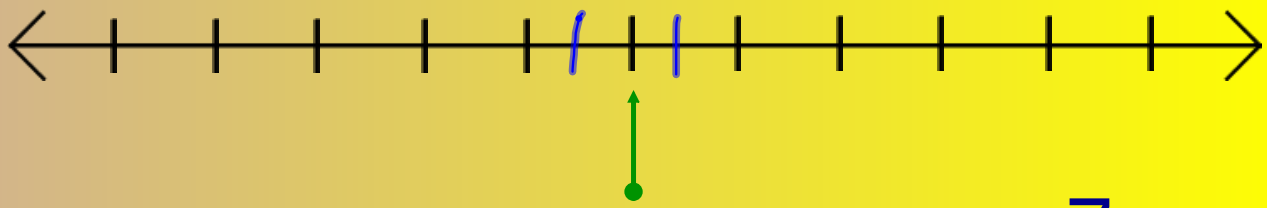
$100x = 43.4343$

$x = 0.4343$

$99x = 43 \quad x = \frac{43}{99}$

Upper and lower bounds

12.1cm



10.0cm

7.8cm

7cm

10·05

9·95 40cm

2.3 to 2

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Bounds

While Mr Xishun, 56, towers above everyone at an astonishing 7.9ft, 19-year-old Mr Pingping is a mere 2.4ft high.

Mr Xishun

The tallest man in the world is 2.36 m.

The smallest man is 73cm.

Mr Pingping

2365cm

Mr Xishun could be as tall as 2.365m
Mr Xishun could be as small as .. 2.355m

2355cm

Mr Pingping could be as tall as 73.5cm
Mr Pingping could be as small as 72.5cm

maxm difference: 2.365 − 0.725 = 1.64cm
minm difference: 2355 − 73.5 = 1.62cm

The lengths of this rectangle are measured to the nearest mm.

67mm

Maxm L = 67.5 Maxm W = 32.5
Minm L = 66.5 Min W = 31.5

32mm

Find the maxm possible
a) perimeter (67.5 + 32.5) × 2 = 200mm
b) area 67.5 × 32.5 = 2193.75 mm²

The lengths of this rectangle are measured to the nearest mm.

61mm

30mm

Find the minimum possible
a) perimeter
b) area

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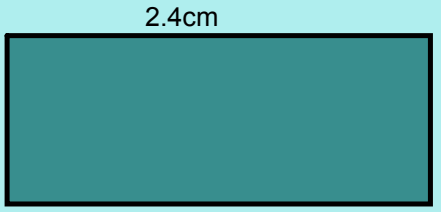
Upper and Lower Bounds



Max L = 2.45cm
Min L = 2.35cm
Max W = 1.85cm
Min W = 1.75cm

A rectangle measured to the nearest mm has the above dimensions. Find the max^{m} and min^{m} perimeter.

Max P = (2.45 + 1.85) × 2 = 8.6cm
Min P = 8.2cm

If a = 3.62 and b= 2.79 to 2 dp

Find the minimum value for

a-b

3.615 − 2.795 = 0.82

a+b

3.615 + 2.785 = 6.4

ab

3.615 × 2.785 = 10.1

a÷b

3.615 ÷ 2.795 = 1.3

Max a = 3.625
Min a = 3.615

Max b = 2.795
Min b = 2.785

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A pair of numbers have a Lowest Common Multiple of 15.
What numbers could they be?

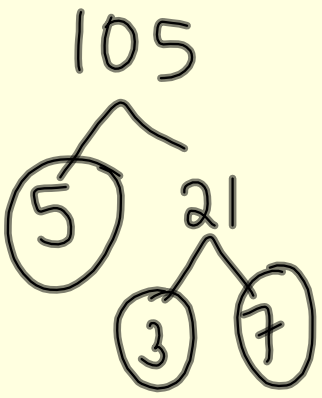
3, 5

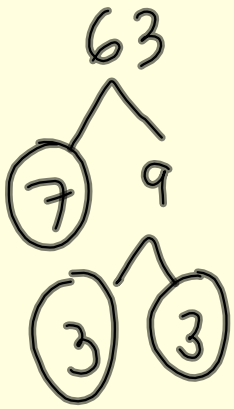
15, 1500

A pair of numbers have highest common factor of 15.
What numbers could they be?

~~30, 60~~ 15, 45 30, 45

Express 105 and 63 as products of primes.
Find their HCF and LCM.





$105 = 3 \times 5 \times 7$

$63 = 3^2 \times 7$

HCF $= 3 \times 7 = 21$

LCM $= 3 \times 5 \times 7 \times 3$
$= 315$

Percentages

Fractions to decimals to percentages (no calc):

0.35	5/6	5%	2/3
35%	0.83	0.05	66.6%
7/20	83%	5/100	0.6
	83.3%	1/20	

Increase/decrease by a percentage (with calc):
Increase £56 by 42% 1.42 × 56 = £79.52
Decrease $99 by 17%

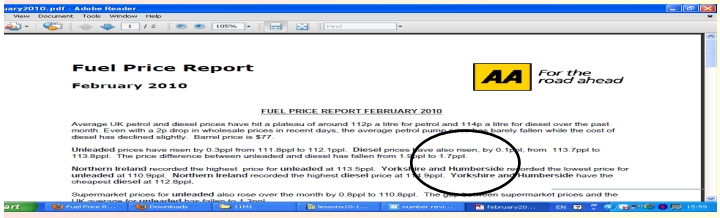
99 × 0.83 = $82.17

Express one number as a percentage of another:

London has a popn of about 7million; Britain has a popn of about 63m.

What percentage of Britain are Londoners? $\frac{7}{63} \times 100 = 11.1\%$

Finding a percentage increase



Find the percentage increase for diesel:

Feb 2010 114p/litre
Feb 2011 132p/litre
Feb 2012 143p/litre

$\frac{18}{114} \times 100 = 15.8\%$ 132 − 114p

$\frac{11}{132} \times 100 = 8.3\%$

Find the original given a percentage change:

A pair of trainers cost £30 in the sale.
They had been reduced by 40%.
How much did they cost before the sale?

10% = £5
40% = 20

60% = £30
1% = 30 ÷ 60 = £0.50
100% = £50

Successive percentage changes

I invest some money at an annual interest rate of 5%. The following year the interest rate goes down to 3.5%.

8.675%

What is the percentage increase in my money after the 2 years?

$x \xrightarrow{\times} 1.05 \rightarrow ?$ $\quad 1.05 \times 1.035 = 1.08675$

$? \rightarrow 1.035 \rightarrow$

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Compound interest

I invest £1000 in the bank with monthly interest rate of 0.3% interest.
How much is it worth at the end of the year.

I borrow £1000 at a monthly interest rate of 1%.
How much do I owe after 1 year?

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no of months/years

$1000 \times 1.01^{12} = £1126.80$

$1000 \times 1.003^{12} = £1036.60$

Principal

rate of interest