Top Math IGCSE

Intensive Maths IGCSE -Oct Nov 2023

Day:1

Topic📚

Numbers

Fraction Decimal Percentage

Ratio and Proportion

Estimating

Standard form

Part - ครูส้ม🍊

4 By writing each number in the calculation correct to 1 significant figure, work out an estimate for the value of

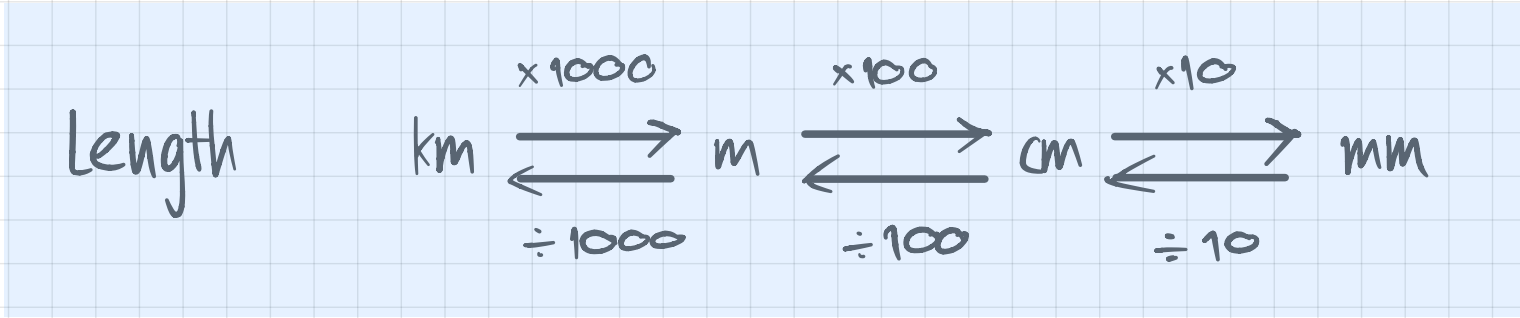
$$\frac{6.7 \times 2.1}{18 - 5.9}.$$

You must show all your working.

..... [2]

Numbers:Ratio and Proportion

Review : Units



7 The scale of a map is 1 : 125 000.
On a map, the length of an island is 9.4 cm.

Calculate the actual length of the island, giving your answer in kilometres.

..... km [2]

10 **Without using a calculator**, work out $2\frac{1}{7} \div \frac{5}{9}$.

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

Numbers:Percentages.

Simple Interest

$$\text{Total interest} = p \times \frac{r}{100} \times t$$

p = Initial amount

r = Rate of interest

t = Time

Numbers:Percentages.

Compound Interest

$$\text{total value} = p\left(1 + \frac{r}{100}\right)^{t}$$

p = Initial amount

r = Rate of change

t = Time

(+) Increase compound interest

(−) Decrease depreciation

Numbers:Percentages.

Example : A man invests £ 15000 in a savings account which pays 8% compound interest per annum. How much will there be after 5 years?

Numbers:Percentages.

Example : Sarah has just bought a car for £ 7000. If the car depreciates by 10% each year. How much will it be worth in 3 years' time.

13 Anya invests \$6000 in an account that pays compound interest at a rate of r% per year.
At the end of 8 years, the account has earned \$621.70 in interest.

Calculate the value of r.

$r =$ ..... [3]

1 Find the temperature that is 8 °C colder than −5 °C.

..... °C [1]

Numbers:Numbers.

Prime Numbers

2 3 5 7 11 13 17 19 23 29 31

"1" is not a prime numbers

"2" is the only even prime numbers

Numbers:Numbers.

Check!!!!!

73

131

57

2 There are two prime numbers in this list.

27 47 57 61 75 93

Work out the sum of these two prime numbers.

..... [2]

4 The distance from town A to town B on a map is 3.5 cm.
The scale on the map is 1 : 250 000.

Find the actual distance, in kilometres, from town A to town B.

..... km [2]

7 **Without using a calculator**, work out $\frac{4}{7} \div 1\frac{5}{21}$.

You must show all your working and give your answer as a fraction in its simplest form.

..... [3]

16 Write $0.62\dot{1}$ as a fraction in its simplest form.
You must show all your working.

..... [3]

6 At the end of the day, a shopkeeper has 12 tins of cat food left.
This is $\frac{3}{13}$ of the number he had at the beginning of the day.

Calculate the number of tins he had at the beginning of the day.

..... [2]

10 **Without using a calculator**, work out $5\frac{11}{12}+2\frac{1}{4}$.

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

13 Calculate $\sqrt{42}+3^{0.4}$.

..... [1]

14 Write $0.58\dot{1}$ as a fraction.
You must show all your working and give your answer in its simplest form.

..... [3]

15 The number of trees in a forest is decreasing exponentially at a rate of 1.75% per year.
Eleven years ago there were 980 trees.

Calculate the number of trees in the forest now.
Give your answer correct to the nearest integer.

..... [2]

Lower Bound and Upper Bound

H = 270 cm. (nearest 10 cm)

H = 270 cm. (nearest cm)

H = 270 cm. (nearest 5 cm)

H = 270 cm. (nearest 30 cm)

Numbers:Estimating

Maximum Value and Minimum Value

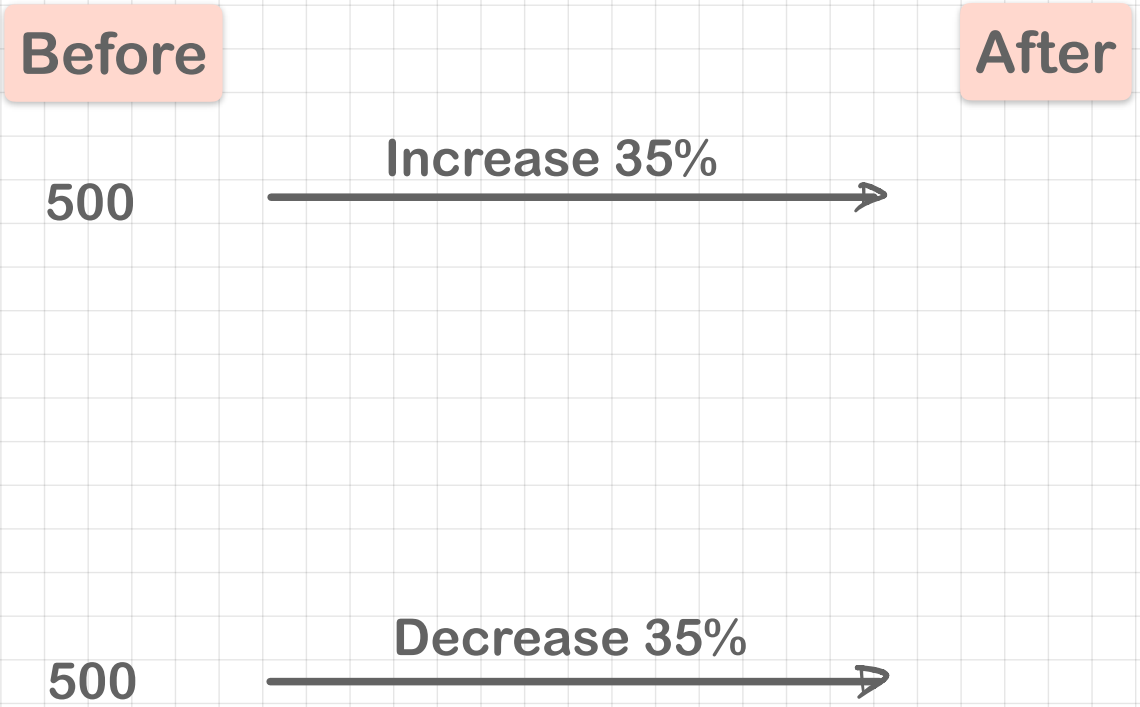
Maximum (Upper Bound)	Minimum (Lower Bound)
$A + B$	$A + B$
$A - B$	$A - B$
$(A)(B)$	$(A)(B)$
$\frac{A}{B}$	$\frac{A}{B}$

23 A train travels between two stations.
The distance between the stations is 220 km, correct to the nearest kilometre.
The speed of the train is 125 km/h, correct to the nearest 5 km/h.

Calculate the upper bound for the time the journey takes.
Give your answer in hours and minutes.

..... h ..... min [4]

Numbers:Percentages.



Numbers:Percentages.

Example: A computer is reduced in price by 35% in the sales.

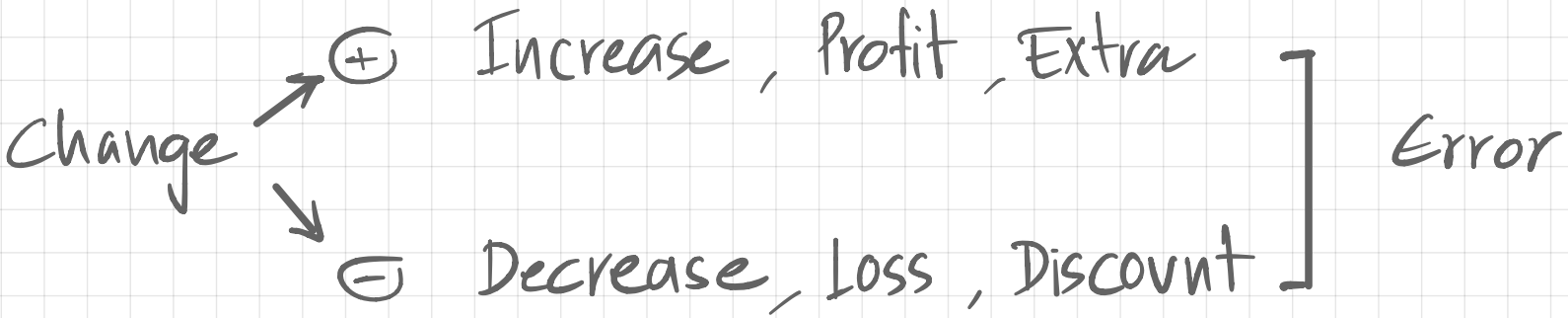
It originally cost £ 580. What is the new price of the computer.

Numbers:Percentages.

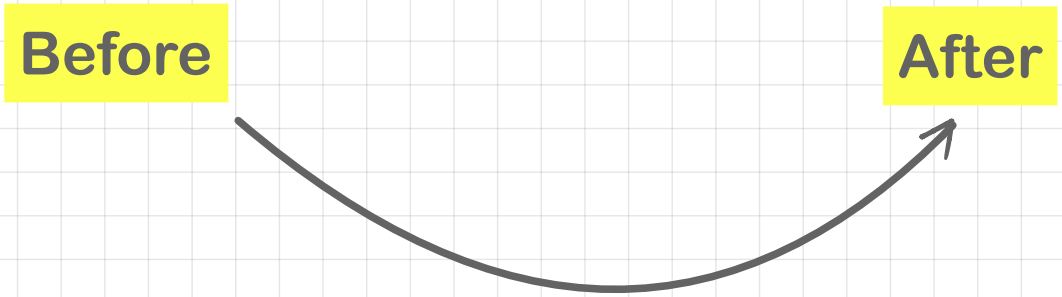
Example: A normal bottle of juice contains 450 ml. A special offer bottle contains 28% extra. How much juice is in the special offer bottle?

Numbers:Percentages.

Finding the percentage change



Numbers:Percentages.



m = 1.15 →

m = 0.74 →

m = 1.02 →

m = 0.97 →

m = 2.15 →

Numbers:Percentages.

Example: An art dealer bought a painting for £ 2500 and sold for £ 3200.

Work out percentage profit.

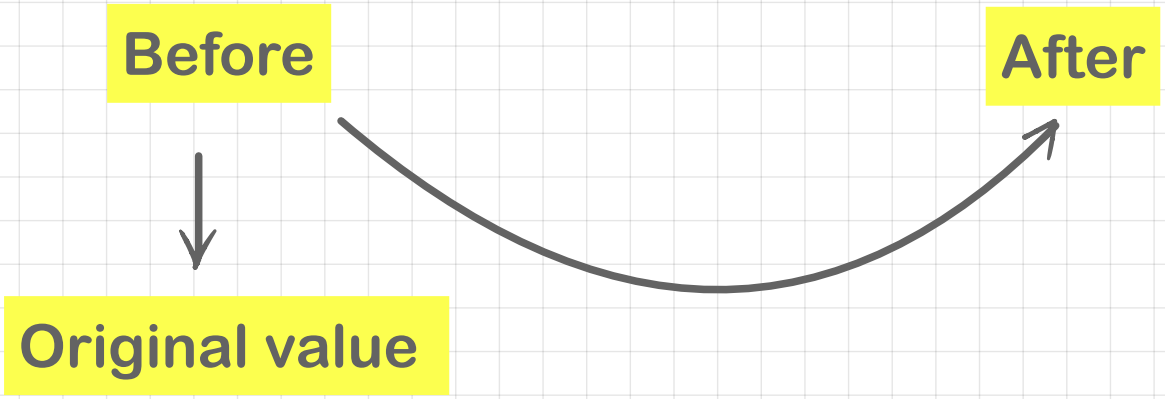
Numbers:Percentages.

Example: Sarah's weight was 75 kg. After dieting,her weight was 69 kg.

Work out Sarah's percentage loss.

Numbers:Percentages.

Finding the original value



Numbers:Percentages.

Example: A house increases in value by 20% to £ 98400.

Find what it was value before the rise.

Numbers:Percentages.

Example : In a sale, normal prices are reduced by 35%. The sale price of a clock is £ 91. Work out the normal price of the clock.

Numbers:Percentages.

Extra : In a sale, reduced by 12%.

The price of a computer is reduce by £ 96. Work out normal price.

Numbers:Percentages.

Extra

Example:The house is valued at €250000. Its value increases by 10% then decreases by 10% the year after. What is the value of house after these two changes.

Numbers:Percentages.

Example:The house value increases by 10% then decreases by 15%

the year after. Find the percentage changes.

1 **(a)** An orchard has 1250 trees.
The trees are in the ratio apple : pear : cherry = 12 : 9 : 4.

(i) Calculate the number of apple trees.

..... [2]

(ii) Last year in the orchard, the mean mass of fruit produced was 64 kg per tree.

Calculate the total mass of fruit produced last year.
Give your answer in tonnes.
[1 tonne = 1000 kg]

..... tonnes [2]

(iii) Last year, the mean mass of pears produced was 54 kg per tree.
This was a decrease of 10% on the mean mass of pears produced per tree from the year before.

Calculate the mean mass of pears produced by each pear tree the year before.

..... kg [2]

(iv) The orchard loses $\frac{1}{5}$ of its total number of trees in a storm.

Calculate the number of trees that remain.

..... [2]

(b) Paulo buys some pears from a market.
Pears cost \$0.54 each or 0.51 euros each.

(i) Paulo pays **in dollars** for 12 pears.

Calculate the change he receives from \$10.

\$ ..... [2]

(ii) The exchange rate is \$1 = 0.826 euros.

Calculate how much more Paulo pays for **each** pear when he pays in euros.
Give your answer in dollars, correct to the nearest cent.

\$ ..... [3]

(b) One year, a farmer makes a profit of $24 730 selling eggs.

Write this profit

(i) correct to 2 significant figures

$ ..... [1]

(ii) in standard form.

$ ..... [1]

(c) On a farm, there are 500 hens, correct to the nearest 10.

(i) In one year, the mean number of eggs laid per hen was 320 eggs, correct to the nearest 20.

Calculate the upper bound for the total number of eggs all the hens lay in that year.

..... [3]

(c) On a farm, there are 500 hens, correct to the nearest 10.

(ii) Another farm has 800 hens, correct to the nearest 20.

Calculate the lower bound for the difference between the number of hens on the two farms.

..... [2]

2 **(a)** Anil changes \$830 into euros when the exchange rate is 1 euro = \$1.16 .
He spends 500 euros.
He then changes the remaining money back into dollars at the same exchange rate.

Work out how much, in dollars, Anil receives.

\$ ..... [3]

(b) In 2021, Anil earns $37 000.

(i) He spends $12 400 on bills in 2021.

Calculate the percentage of his earnings he spends on bills.

..... % [2]

(ii) His earnings of $37 000 increase by 3.2% in 2022.

Calculate his earnings in 2022.

$ ..... [2]

(c) Anil invests \$3500 in an account that pays a rate of 2.4% per year compound interest.

(i) Calculate the total interest earned at the end of 5 years.

\$ ..... [3]

(c) Anil invests \$3500 in an account that pays a rate of 2.4% per year compound interest.

(ii) Find the number of complete years before Anil has at least \$5000 in this account.

..... years [3]

1 **(a)** Tomas sells a computer, a bike and a phone.
The amounts he receives are in the ratio computer : bike : phone = 14 : 17 : 9.

(i) Calculate the amount he receives for the phone as a percentage of the total.

..... % [2]

(ii) The total amount he receives is $560.

Calculate how much he receives for the bike.

$ ..... [2]

(iii) Tomas originally bought the bike for $195.
He wanted to make a profit of at least 25% when he sold it.

Does Tomas make a profit of at least 25%?
You must show all your working to support your decision.

[3]

(b) Ulla invests $725 for 6 years in an account paying simple interest at a rate of 1.3% per year.

Calculate the total interest earned at the end of 6 years.

$ ..... [2]

(c) In a sale, all prices are reduced by 24%.
Victor pays $36.86 for a pair of shoes in the sale.

Calculate the original price of the shoes.

$ ..... [2]

3 **(a)** The scale drawing shows two sides, AB and BC, of a field.
The scale is 5 centimetres represents 200 metres.

Scale: 5 cm to 200 m

(iii) Find the scale in the form 1 : n.

1: ..... [2]

1 At noon, the temperature is 4 °C.
At midnight, the temperature is −9 °C.

Work out the difference in temperature between noon and midnight.

..... °C [1]

3 Figs cost 43 cents each.
Lyra has $5 to buy some figs.

Calculate the largest number of figs Lyra can buy and the amount of change, in cents, she receives.

..... figs and ..... cents change [3]

4 Find the value of $\sqrt{68} \times \sqrt{153}$.

..... [1]

7 The price of a coat is $126.
In a sale, this price is reduced by 18%.

Find the sale price of the coat.

$ ..... [2]

13 **Without using a calculator**, work out $4\frac{1}{8} - 2\frac{5}{6}$.

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

14 Carlos invests \$4540 at a rate of r% per year compound interest.
At the end of 10 years he has earned \$1328.54 in interest.

Calculate the value of r.

$r =$ ..... [3]

Numbers:Numbers.

LCM and HCF

LCM-Lowest Common Multiple

The smallest number that will divide by all the numbers in question

(Big value)

HCF-Highest Common Factor

The biggest number that will divide into all the numbers in question

(Small value)

Example:Find HCF and LCM of 90,150

Example: Find HCF and LCM of A and B .

$A = 2^3 \times 3^5 \times 5$

$B = 2 \times 3^2 \times 5^2 \times 7$

Example: Find HCF and LCM of A and B .

$A = 2^5 X^3 Y^4$

$B = 2^3 (5) X^7 Y^3$

Extra : $(X_1)(X_2)$ = (HCF of X_1 and X_2)(LCM of X_1 and X_2)

HCF of 90 and 150 is 30

LCM of 90 and 150 is 450

Extra : $(X_1)(X_2)$ = (HCF of X_1 and X_2)(LCM of X_1 and X_2)

Example: x and 147 have HCF = 21 and LCM = 735. Find value of x.

Example: Find HCF and LCM of A and B .

$$A = 2^5 X^3 Y^4$$

$$B = 2^3 (5) X^7 Y^3$$

Example: Find HCF and LCM of A , B and C.

$A = 2^4 \times 3 \times 7$

$B = 2^3 \times 3^2 \times 5$

$C = 2^2 \times 5 \times 7$

15 Find the highest common factor (HCF) of $12a^3b$ and $20a^2b^2$.

..... [2]

12 f is a common factor of 14 and 28.
m is a common multiple of 10 and 25.
p is a prime number.

Work out the largest possible value of $\frac{f}{mp}$.

..... [4]

1 **(a)** Find the lowest common multiple (LCM) of 30 and 75.

..... [2]

(b) Share \$608 in the ratio 4 : 5 : 7.

\$ .....

\$ .....

\$ ..... [3]

(c) Work out $\dfrac{6.39\times10^{4}}{2.45\times10^{6}}$.

Give your answer in standard form.

..... [2]

(d) Write $0.\dot{2}\dot{7}$ as a fraction.

..... [1]

6 **(a)** At a festival, 380 people out of 500 people questioned say that they are camping.
There are 55 300 people at the festival.

Calculate an estimate of the total number of people camping at the festival.

..... [2]

(b) 12 friends travel to the festival.
5 travel by car, 4 travel by bus and 3 travel by train.
Two people are chosen at random from the 12 friends.

Calculate the probability that they travel by different types of transport.

..... [4]

(c) Arno buys a student ticket for $43.68 .
This is a saving of 16% on the full price of a ticket.

Calculate the full price of a ticket.

$ ..... [2]

(d) At a football match, there are 29 800 people, correct to the nearest 100.

(i) At the end of the football match, the people leave at a rate of 400 people per minute, correct to the nearest 50 people.

Calculate the lower bound for the number of minutes it takes for all the people to leave.

..... min [3]

(d) At a football match, there are 29 800 people, correct to the nearest 100.

(ii) At a cricket match there are 27 500 people, correct to the nearest 100.
Calculate the upper bound for the difference between the number of people at the football match and at the cricket match.

..... [2]

(d) On one journey, all 56 seats on the bus are filled.
The ratio of adults to children on this journey is adults : children = 5 : 3.
The cost for an adult ticket is \$2.80 .
The cost for a child ticket is $\frac{3}{4}$ of the adult cost.

Work out the total cost of the tickets for this journey.

\$ ..... [4]