

ARITHMETIC

- WE NEED TO BE VERY COMFORTABLE WORKING WITH PERCENTAGES.

IN PARTICULAR

TO WRITE SOMETHING AS A PERCENTAGE OF SOMETHING ELSE :

- ① WRITE IT AS A FRACTION
- ② MULTIPLY BY 100 TO MAKE IT A PERCENTAGE.
(USE FRACTION BUTTON ON YOUR CALCULATOR)

eg WRITE 350g AS A PERCENTAGE OF 1kg
• UNITS NEED TO BE THE SAME.

ANS $\frac{350}{1000} \times 100 = 35\%$

WE SAY: 350g OUT OF 1000g

THIS IS USED FOR

- eg
- PERCENTAGE PROFIT
 - PERCENTAGE LOSS

+ LOADS MORE

TO GET A PERCENTAGE OF SOMETHING

- ① WRITE PERCENTAGE AS A DECIMAL

TECHNICALLY THIS BIT IS OPTIONAL

- ② MULTIPLY THE DECIMAL BY THE NUMBER YOU'RE GETTING THE PERCENTAGE OF.

eg (i) 25% of £360

ANS $0.25 \times 360 = \boxed{€90}$

(ii) 12.7% of 4,550

$0.127 \times 4550 = \boxed{577.85}$

WE NEED BOTH OF THESE TECHNIQUES FOR

LOADS OF QUESTIONS.

TAX / DEDUCTIONS FROM INCOME

- STATUTORY
 - NON-STATUTORY
- DEDUCTIONS FROM INCOME
- ↑
MONEY YOU EARN FOR DOING A JOB.
- STATUTORY DEDUCTIONS MUST BE PAID TO THE GOVERNMENT.
(eg INCOME TAX, PRSI, USC)
 - NON-STATUTORY DEDUCTIONS ARE VOLUNTARY
(eg PENSION PLAN, SAVINGS, UNION FEES)

TAX

BEFORE WE REVISE HOW INCOME TAX WORKS, WE REMEMBER :

- MULTIPLY TAX RATE X INCOME
TO GET GROSS TAX
- NET TAX IS THE ACTUAL AMOUNT OF TAX YOU HAVE TO PAY.

- TAX CREDITS - ARE LIKE A "DISCOUNT". THIS FIGURE IS TAKEN AWAY FROM THE TAX BILL. AT THE END OF THE CALCULATIONS

ie. TAX CREDITS ARE DEDUCTED FROM THE GROSS TAX TO CALCULATE THE TAX PAYABLE / NET TAX

TAX EXAMPLE :

THIS MEANS "IN A YEAR"

JOHN EARNS € 27,000 PER ANNUM. HE

PAYS TAX AT THE STANDARD RATE OF 22%

HE HAS A TAX CREDITS OF € 3,500.

CALCULATE :

(a) HIS GROSS TAX

(b) HIS NET TAX / TAX PAYABLE

(c) HIS TAKE-HOME PAY

$$\begin{aligned} \text{(a) GROSS TAX} &= 27,000 \times 22\% \\ &= 0.22 \times 27,000 \\ &= \boxed{\text{€ } 5,940} \end{aligned}$$

$$\begin{aligned} \text{(b) NET TAX} &= \text{GROSS TAX} - \text{TAX CREDITS} \\ &= 5,940 - 3,500 \\ &= \boxed{\text{€ } 2,440} \end{aligned}$$

$$\begin{aligned} \text{(c) TAKE-HOME PAY} &= 5,940 - 2,440 \\ &= \boxed{\text{€ } 3,500} \end{aligned}$$

VAT (VALUE ADDED TAX)

LIKE THE EXTRA TAX YOU HAVE TO PAY WHEN YOU GO SHOPPING IN AMERICA

eg. A COMPUTER COSTS €650 PLUS 21% VAT. CALCULATE THE PRICE INCLUDING VAT.

ALGEBRA

①	$0.21 \times 650 = 136.50$	① FIND 21% OF 650
②	$650 + 136.50 = \boxed{€786.50}$	② ADD THIS TO THE €650

ALGEBRA

①	$1.21 \times 650 = \boxed{€786.50}$	① FIND 121% OF €650
	\uparrow $\boxed{\text{THIS IS 121\%}}$	

• DIFFICULT QUESTIONS : YOU MIGHT HAVE TO WORK BACKWARDS. THEY TELL YOU THE PRICE INCLUDING VAT. THE IMPORTANT QUESTION YOU NEED TO ASK YOURSELF IS

"WHAT PERCENTAGE OF THE "ORIGINAL PRICE" IS THAT?"

eg. MR O'BRIEN BOUGHT A COMPUTER FOR HIS COMPANY WHICH COST €984 INCLUDING VAT AT 23%. HIS COMPANY SHOULDN'T PAY VAT, SO HE CAN CLAIM THIS AMOUNT BACK! WHAT WAS THE ORIGINAL PRICE OF THE COMPUTER BEFORE VAT WAS ADDED?

ANS:

$$\text{ORIGINAL PRICE} + \text{VAT} = \text{€ } 984$$

THIS IS WHAT WE'RE TRYING TO FIND

$$100\% + 23\% = 984$$

$$\text{SO } 123\% = 984$$

$$\text{i.e. } (\text{ORIGINAL AMOUNT}) \times 1.23 = 984$$

ORIGINAL AMOUNT

$$= 984 \div 1.23$$

÷ BOTH SIDES BY 1.23

$$= \boxed{\text{€ } 800}$$

PERCENTAGE PROFIT / LOSS

ALWAYS WRITE

$$\frac{\text{PROFIT / LOSS}}{\text{ORIGINAL AMOUNT}} \times 100$$

ALWAYS ORIGINAL UNLESS THE QUESTION SAYS OTHERWISE.

BE VERY CAREFUL ABOUT THE WORDING OF THE QUESTIONS

HOUSEHOLD BILLS

eg ELECTRICITY / GAS / PHONE .

USUALLY IN 3 PARTS :

(eg GAS BILL)

- STANDING CHARGE

THIS IS A STANDARD AMOUNT OF MONEY YOU HAVE TO PAY EACH MONTH REGARDLESS OF HOW MUCH GAS YOU USE .

- USAGE CHARGE

NO. OF UNITS \times RATE
(PER UNIT)

DEPENDS ON HOW MANY "UNITS" OF GAS YOU USE. YOU MIGHT NEED TO READ THIS FROM THE BILL .

- V.A.T.

AS BEFORE .

INTEREST / COMPOUND INTEREST

$$F = P(1+i)^t$$

eg MIKE INVESTS €5,000 FOR 6 YEARS AT 3% INTEREST.

HOW MUCH WILL HE HAVE AT THE END OF THE 6 YEARS?

↑
IN TABLES BOOK

① WRITE THE FORMULA

$$F = P(1+i)^t$$

② WRITE DOWN WHAT EACH LETTER IS.

F = FINAL AMOUNT = ?

P = PRINCIPAL (START AMOUNT) = 5000

i = INTEREST RATE (IN DECIMALS) = 0.03

t = TIME = 6

3) SUBSTITUTE THESE VALUES INTO THE FORMULA

$$F = P(1+i)^t$$

$$F = 5000(1.03)^6$$

4) USE YOUR CALCULATOR :

$$F = \boxed{\text{€}5,970.26}$$

FOR YOUR JUNIOR CERT, THIS CAN ONLY BE ASKED FOR UP TO 3 YEARS. YOU CAN WORK OUT ALL OF THIS SEPARATELY WITHOUT THE FORMULA.

REMEMBER.

AMOUNT AT
END OF
YEAR

=

AMOUNT AT
START OF
YEAR

+

INTEREST

$$\text{INTEREST} = \text{AMOUNT AT START} \times \text{INTEREST RATE}$$

CONVERSION

(UNITS / CURRENCY)

CURRENCY EXCHANGE :

eg. $€1 = \$1.32$

ALCULATE THE VALUE OF

(i) $€370$ IN DOLLARS (ii) $\$750$ IN EURO

(i) $€1 = \$1.32$

$$€370 = 370 \times 1.32$$

$$= \$488.40$$

(ii) $\$1.32 = €1$ ← € ON RIGHT

$$\begin{aligned} \$750 &= 750 \div 1.32 \\ &= €568.18 \end{aligned}$$

- YOU WILL BE GIVEN AN EXCHANGE RATE
- WRITE DOWN THIS EXCHANGE RATE WITH THE CURRENCY YOU ARE TRYING TO CALCULATE ON THE RIGHT.
- YOU WILL EITHER MULTIPLY OR DIVIDE BY THIS RATE DEPENDING ON ~~IT~~ WHAT YOU'RE TRYING TO CALCULATE.
- IF YOU'RE NOT SURE, DO BOTH + CHECK WHICH ANSWER MAKES SENSE
- BE CAREFUL WITH COMMISSION ADD / SUBTRACT A PERCENTAGE...

UNITS (eg METRIC / IMPERIAL)

- AS WITH CURRENCY EXCHANGE, DECIDE WHETHER YOU NEED TO MULTIPLY OR DIVIDE BY THE CONVERSION RATE.

RATIO / PROPORTION

- KNOW HOW TO DIVIDE AN AMOUNT IN A RATIO.

eg DIVIDE €900 IN THE RATIO 7:8:3

① ADD THE NUMBERS OF "PARTS" IN THE RATIO

$$7 + 8 + 3 = 18 \text{ PARTS}$$

② DIVIDE THE €900 INTO 18 EQUAL PARTS.

$$900 \div 18 = \text{€}50 \leftarrow 1 \text{ PART}$$

③ MULTIPLY THIS BY EACH NUMBER OF PARTS IN THE RATIO

$$7 \times 50 = 350$$

$$8 \times 50 = 400$$

$$3 \times 50 = 150$$

CHECK
900

$$7 : 8 : 3$$

350	:	400	:	150
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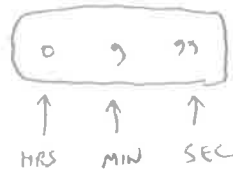
TIME CALCULATIONS

TIMETABLES : ALWAYS PICK A NUMBER/TIME IN THE TABLE AND MAKE SENSE OF IT. WHAT DO THESE NUMBERS MEAN??

BE CAREFUL WITH TIME CALCULATIONS

THERE ARE NOT 100 MINUTES IN AN HOUR

USE THE MAGIC "TIME" BUTTON FOR ANY TRICKY TIME CALCULATIONS.



RATES OF CHANGE

(SLOPES / HOW FAST SOMETHING IS CHANGING)

eg SPEED

$$\text{RATE OF CHANGE} = \frac{\text{AMOUNT OF CHANGE}}{\text{CHANGE IN TIME}}$$

REMEMBER !



"DAD'S SILLY TRIANGLE"

eg TO CALCULATE DISTANCE, COVER "D"

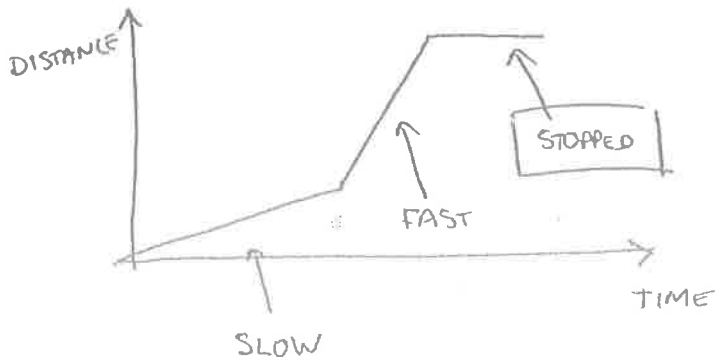
SO $D = S \times T$

$$S = \frac{D}{T}$$

$$T = \frac{D}{S}$$

DISTANCE - TIME GRAPHS

$$\text{SLOPE} = \text{SPEED}$$



REMEMBER
RATE OF CHANGE CAN BE NEGATIVE

BE ABLE TO DESCRIBE WHAT IS HAPPENING AT PARTICULAR PARTS OF A GRAPH