PSLE Math (Std) Study Notes

#GetExamReady

Yayasan MENDAKI

COMPLEX PROBLEM-SOLVING STRATEGIES

1. SIMULTANEOUS EQUATIONS

Problems involving ***SIMULTANEOUS EQUATIONS*** are commonly tested in recent PSLE examinations. Each question usually involve 2 or 3 identities that we do not know their relationship with each other. Often, model drawing approach is impossible as we do not know the size of each bar to draw.

To solve the simultaneous equations, we use the method of **'elimination'** ie making one of the identities equal in both equations so as to **'eliminate'** or '**get rid of'** it so as to solve the other identity. The calculator can also help us to **check** the accuracy of our answers.

Example

3 phones and 3 radios cost $1521. Two similar phones and a similar radio cost $934. How much does a radio cost?

***Solution**:*

3 P + 3 R → $1521

1 P + 1 R → $1521÷3 = $507----- (1)

2 P + 1 R → $934 ----- (2)

(2) - (1)

1 P → $934 – $507 = $427

1 R → $507 – $427 = **$80**

Characteristics of Problem

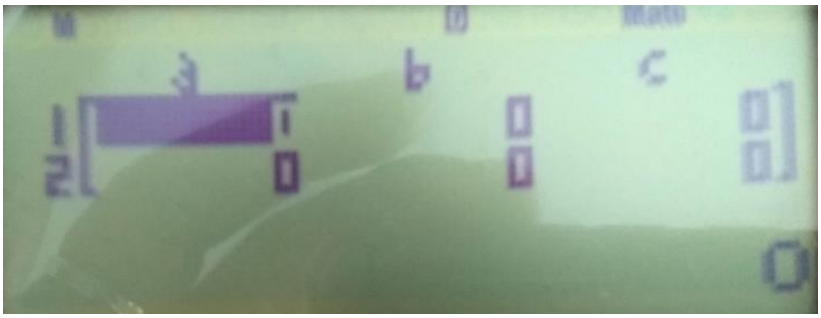
- No known relationship between 1 phone and 1 radio
- 2 identities → 2 equations
- Label the 2 equations (1) and (2)
- Make 1 of the identities equal ie 1 R
- Find the difference between equations (1) and (2)→ 1 P
- Eliminate 1 identity to find the other identity

How to use the calculator to CHECK the answers of the identities or unknowns?

Note: Before we start, change the mode of your calculator using the following steps

1. **MODE**
2. Press '**3**' to choose **'3: EQN'**
3. Press '**1**' to choose **'1: $a_nX+b_nY=c_n$"**

Calculator Display



Example

3 P + 3 R → $1521

2 P + 1 R → $934

3 = 3 = 1 5 2 1 =

2 = 1 = 9 3 4 =

Calculator Display

	a	*b*	*c*
1	*3*	*3*	*1521*
2	*2*	*1*	*934*

= (X=) 427

= (Y=) 80

P = 427, R = 80

2. EQUAL FRACTIONS

Problems involving ***EQUAL FRACTIONS*** usually compare two fractions whose **numerators** are **EQUAL** to each other. More often, students confuse that the denominators are equal. Sometimes, the fractions take the form of percentages, decimals or ratios. It is always advisable to change all other forms to fractions or ratios as it will be easier to compare the identities and the number of units.

Example

*In a company of 200 workers, $\frac{1}{2}$ of the **male** workers is **equal** to $\frac{3}{4}$ of the **female** workers. How many **more male** workers **than female** workers are there in the company?*

Solution:

$\frac{1^{\times 3}}{2^{\times 3}} M = \frac{3}{4} F$

Equate Numerator

$\frac{3}{6}$ M = $\frac{3}{4}$ F

Total M = 6u

Total F = 4u

10u → 200

1u → 200 ÷10 = 20

2u → 20 x 2 = **40**

Characteristics of Problem

- ☐ Equate both fractions
- ☐ Make **numerators equal**, **NOT DENOMINATORS**
- ☐ **Final denominators** refer to **total** number of units for **female & male** workers respectively

3. **REMAINDER**

Problems involving ***REMAINDER*** usually deal with fractions or percentages of remainders. The usual way to solve this type of problem is usually the model method. However, the model method has its limitations. Usually, it relies solely on the numbers used in the questions to determine the number of units drawn in the model. To solve this problem, the '**branch method**' is used which helps us to see the different parts of the total at a glance **('fraction of whole')**

Example 1

John spent $\frac{1}{4}$ *of his money on food and* $\frac{1}{7}$ *of the remainder on a bag. He had $12 left. How much money did he spend on the bag?*

Solution:

Branch

Money (Whole)

$\frac{1}{4}$ (food) $\frac{3}{4}$ (remainder)

$\frac{6}{7}$ (left - $12) $\frac{1}{7}$ (bag)

Characteristics of Problem

- 'of the remainder'
- There are 1 main group (whole) and 1 small group (remainder)
- $\frac{1}{7}$ of remainder is different from $\frac{1}{7}$ of total

Fraction of Whole

$\frac{3}{4} \times \frac{1}{7} = \frac{3}{28}$ (bag)

$\frac{3}{4} \times \frac{6}{7} = \frac{18}{28}$ (left)

$\frac{1}{4} = \frac{7}{28}$ (food)

Note:
- Make the denominators the same.
- The final fraction should add to 1 whole

18u → 12

1u → $\frac{12}{18} = \frac{2}{3}$

3u → $\frac{2}{3} \times 3 = 2$

Ans: **$2**