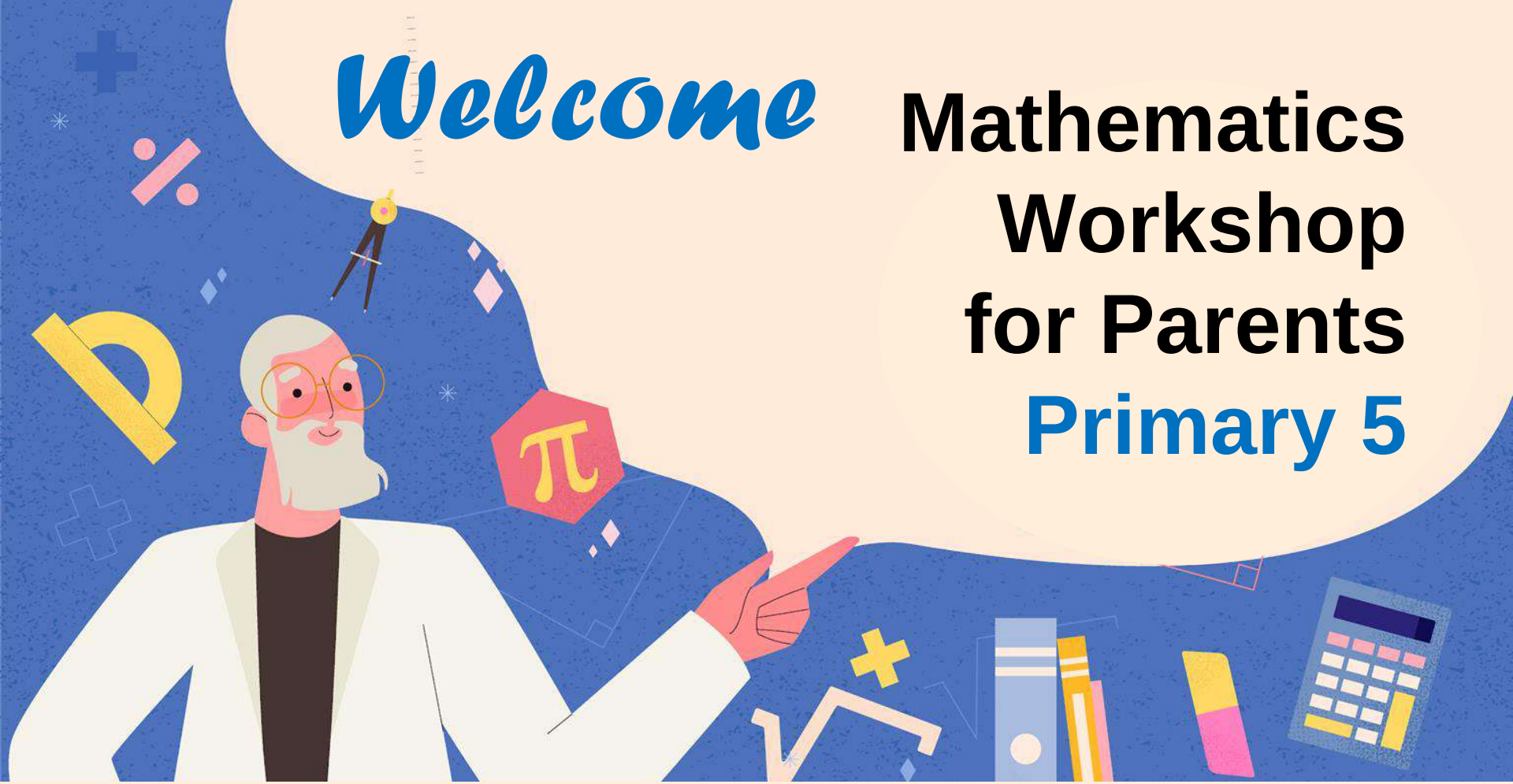


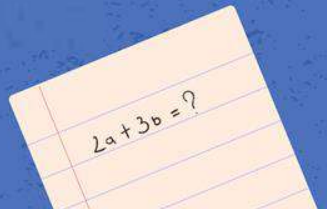
Organised by Northland Primary Mathematics Department

01 Model Drawing
(Mr Chang Cheng Hwee)

02 Guess & Check
(Ms Shiamala)

03 Assumption Method & Exam Format
(Mrs Lim-Koh Kha Tiang)

04 Misconceptions & Common Errors
(Mrs Chong Cheng Cheng)



Model Drawing Crash Course

Why draw models?

- Make thinking visible
  - Analyse more clearly and easily
- Diagnose error
  - Conceptual or Computational

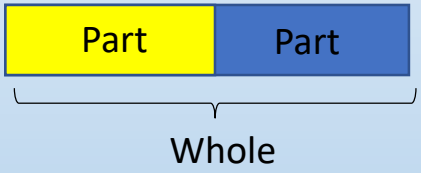
Tips for Effective Model Drawing

- Neatness
  - Freehand or Use ruler
- Proportion
  - Accuracy
- Alignment

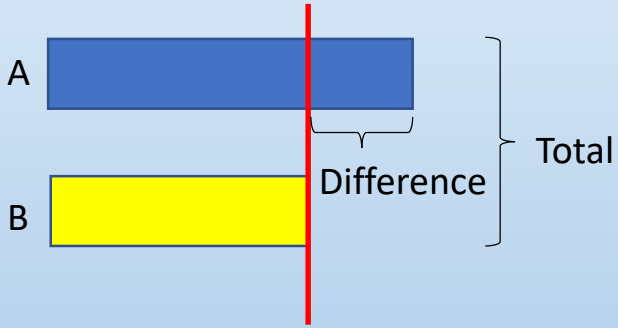
- SIZE
- Speed
- Use of Colour

3 Basic Model Types

Part-Whole

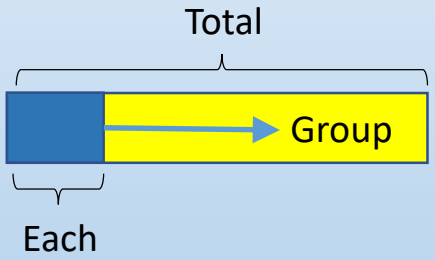


Comparison



G-E-T

(Group-Each-Total)

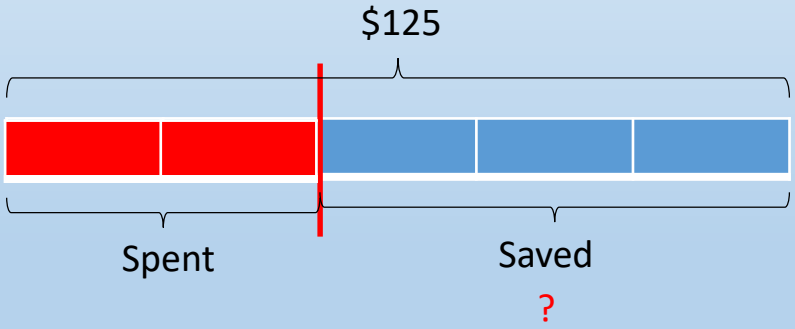


Part-Whole

Alvin has $125.

He spent $\frac{2}{5}$ of it and saved the rest.

How much did he save?



Method 1 (Unitary Method)

5 units = $125

1 unit = $125 ÷ 5 = $25

3 units = 3 × $25 = $75

Method 2 (Fraction of a quantity)

Saved → $\frac{3}{5}$ × $125 = $75

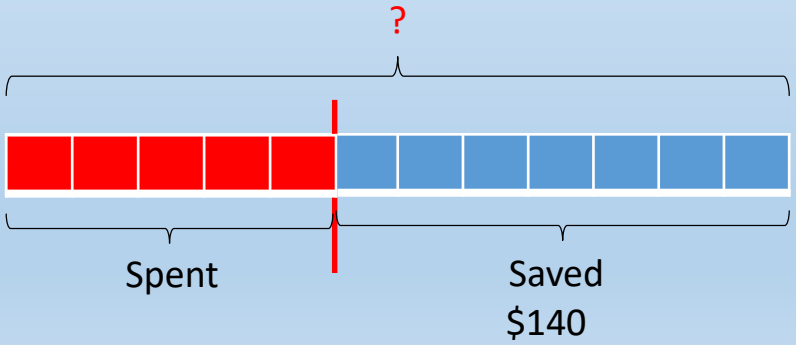
Ans: $75

Part-Whole

Alvin had some money.

He spent $\frac{5}{12}$ of it and saved the rest.

If he saved \$140, how much did he have at first?



Solution

7 units = \$140

1 unit = \$140 ÷ 7 = \$20

12 units = 12 × \$20 = \$240

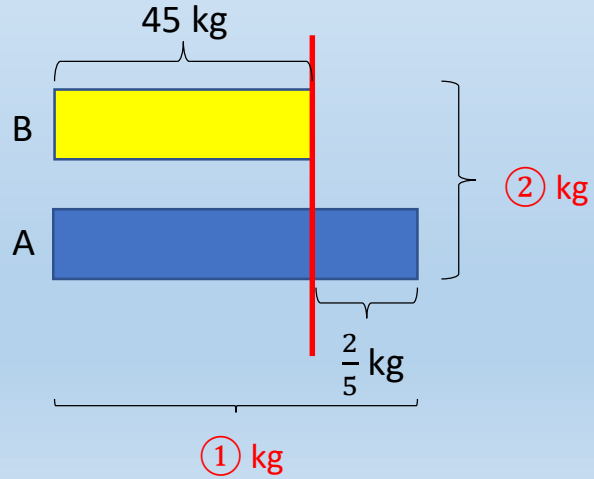
Ans: \$240

Comparison

Brendan weighs 45 kg.

Alvin weighs $\frac{2}{5}$ kg more than Brendan.

How much do they weigh altogether?



Solution

① → 45 kg + $\frac{2}{5}$ kg = $45\frac{2}{5}$ kg

② → 45 kg + $45\frac{2}{5}$ kg = $90\frac{2}{5}$ kg

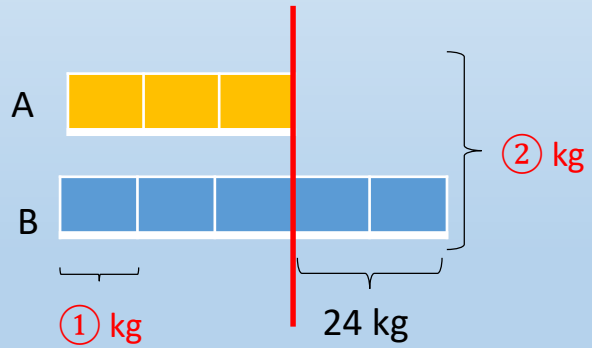
Ans: $90\frac{2}{5}$ kg

Comparison

Alvin weighs $\frac{3}{5}$ as much as Brendan.

Brendan weighs 24 kg more than Alvin.

How much do they weigh altogether?



Solution

① → 24 kg ÷ 2 = 12 kg

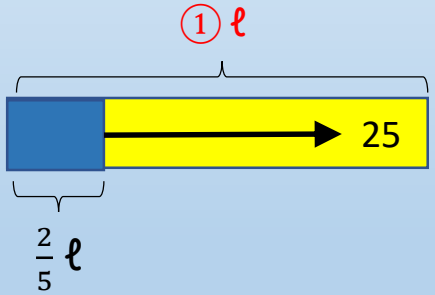
② → 8 × 12 kg = 96 kg

Ans: 96 kg

G-E-T
(Group-Each-Total)

A glass can hold $\frac{2}{5}$ litre of water.

How much water can 25 such glasses hold?



Solution

① → $25 \times \frac{2}{5}\ \ell = 10\ \ell$

Ans: 10 litres

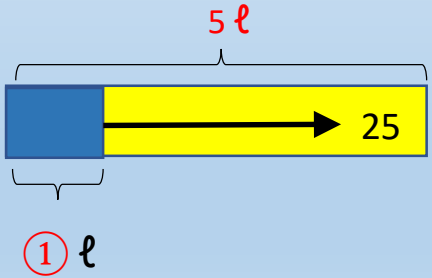
G-E-T
(Group-Each-Total)

A pail contains 5 litres of water.

All the water in the pail was used to fill 25 glasses completely.

What is the capacity of each glass?

Give your answer in litres.



Solution

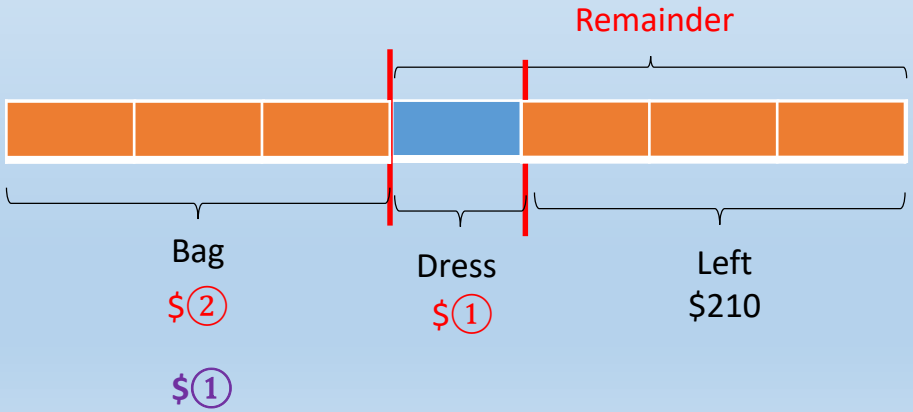
$① \rightarrow 5\ \ell \div 25 = \frac{1}{5}\ \ell$

Ans: $\frac{1}{5}$ litre

Topic: Fraction of a Remainder (Level 1)

Agnes spent $\frac{3}{7}$ of her money on a bag and $\frac{1}{4}$ of the remainder on a dress. She had $210 left.

How much money did she spend on the bag?



Solution

① → $210 ÷ 3 = $70

② → 3 × $70 = $210

ALTERNATIVELY

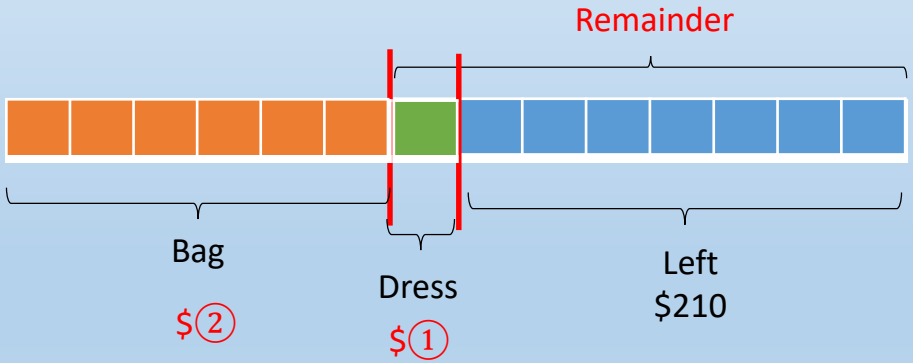
① → **$210**

Ans: $210

Topic: Fraction of a Remainder (Level 2)

Agnes spent $\frac{3}{7}$ of her money on a bag and $\frac{1}{8}$ of the remainder on a dress. She had $210 left. How much money did she spend on the bag?

LCM(4,8) = 8



Solution

① → $210 ÷ 7 = $30

② → 6 × $30 = $180

Ans: $180

Topic: Equal Parts from Different Wholes (P6)

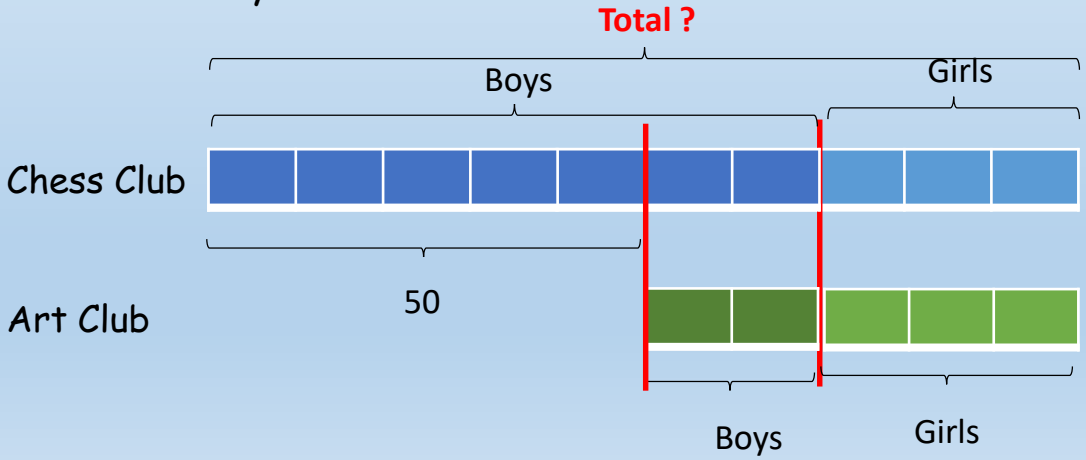
$\frac{7}{10}$ of the members in the Chess Club are boys.

$\frac{2}{5}$ of the number of members in Art Club are boys.

The number of girls in both clubs are the same.

The difference in the number of boys in both clubs is 50.

How many members are there in the Chess Club?



Solution :

Proportional Thinking

5 units = 50

10 units = 2 × 50 = 100

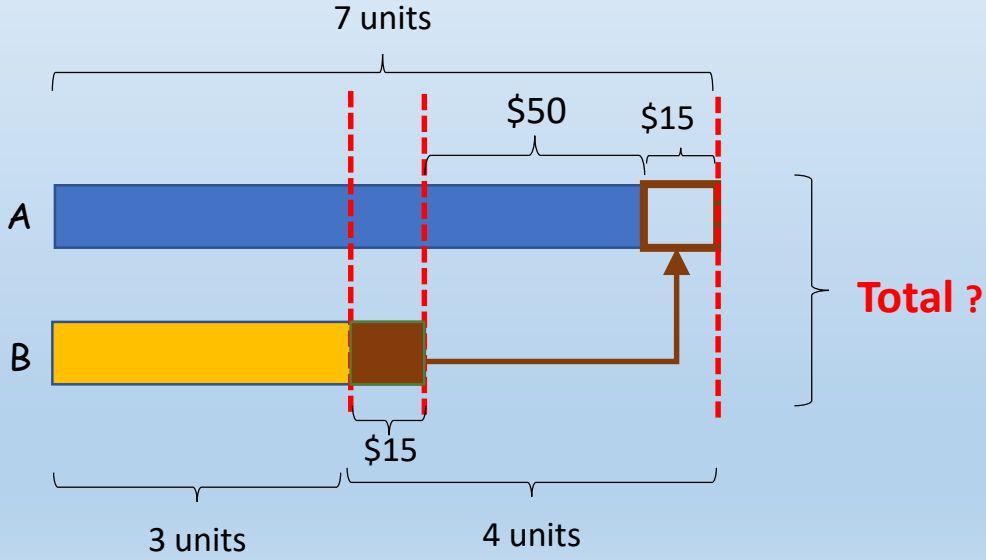
Ans: 100

Topic: Internal Transfer

Alvin had $50 more than Brandon.

After Brandon gave Alvin $15, Brandon had $\frac{3}{7}$ as much money as Alvin.

How much money did they have altogether?



Solution

4 units = $15 + $50 + $15 = $80

1 unit = $80 ÷ 4 = $20

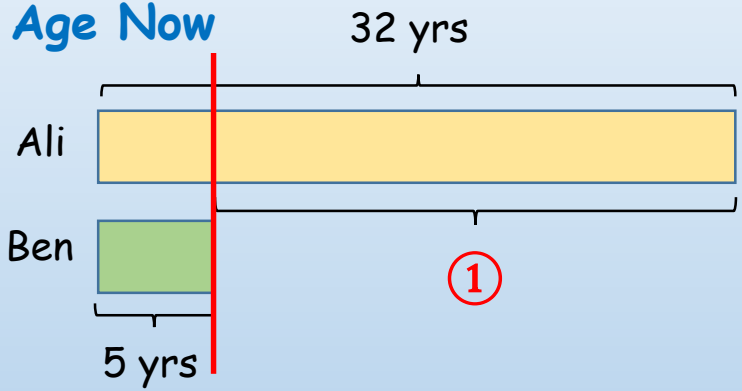
10 units = 10 × $20 = $200

Ans: $200

Age Problem

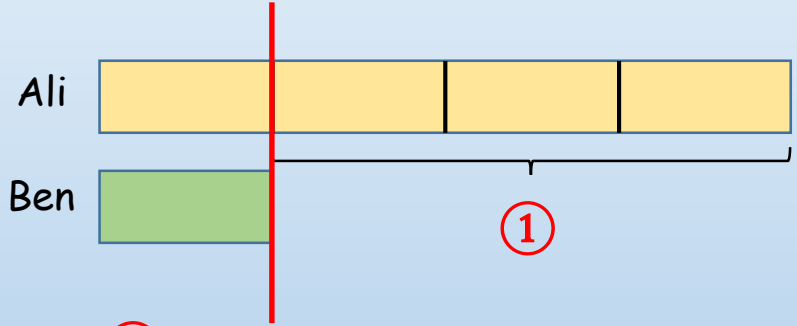
Ali is 32 years old and Ben is 5 years old. In how many years' time will Ali be four times as old as Ben? [Constant Difference/Unchanged Difference]

Age Now



① Difference → 32 – 5
= 27 yrs

? Years' time



① 3 units → 27 yrs
1 unit → 27 ÷ 3
= 9 yrs

No. of years' time → 9 – 5 = 4 yrs

Ans: 4 years

Guess and Check

A problem-solving strategy that students can use to solve mathematical problems by **guessing** the answer and then **checking** that the **guess** fits the conditions of the problem.

Example 1

A car park is filled with 25 cars and motorcycles in total. If there are 82 wheels altogether, how many cars are there?

?

4 wheels

+

?

2 wheels

= 82 wheels

Method 1 : Step 1 Build the Table

A car park is filled with 25 cars and motorcycles in total. If there are 82 wheels altogether, how many cars are there?

No. of Cars					

Method 1 : Step 2 Guess

A car park is filled with 25 cars and motorcycles in total. If there are 82 wheels altogether, how many cars are there?

No. of Cars	No. of Wheels (Cars)	No. of Motorcycles	No. of Wheels (Motorcycles)	Total Wheels	Check for 82
13	13 x 4 = 52	12	12 x 2 = 24	52 + 24 = 76	X

Method 1 : Step 2 Keep Guessing

A car park is filled with 25 cars and motorcycles in total. If there are 82 wheels altogether, how many cars are there?

No. of Cars	No. of Wheels (Cars)	No. of Motorcycles	No. of Wheels (Motorcycles)	Total Wheels	Check for 82
13	13 x 4 = 52	12	12 x 2 = 24	52 + 24 = 76	X
15	15 x 4 = 60	10	10 x 2 = 20	60 + 20 = 80	X

Method 1 : Step 3 Keep Guessing

A car park is filled with 25 cars and motorcycles in total. If there are 82 wheels altogether, how many cars are there?

No. of Cars	No. of Wheels (Cars)	No. of Motorcycles	No. of Wheels (Motorcycles)	Total Wheels	Check for 82
13	13 x 4 = 52	12	12 x 2 = 24	52 + 24 = 76	X
15	15 x 4 = 60	10	10 x 2 = 20	60 + 20 = 80	X
16	16 x 4 = 64	9	9 x 2 = 18	64 + 18 = 82	✓

There are 16 cars.

Method 2 : Step 2 Guess

A car park is filled with 25 cars and motorcycles in total. If there are 82 wheels altogether, how many cars are there?

No. of Cars	No. of Wheels (Cars)	No. of Motorcycles	No. of Wheels (Motorcycles)	Total Wheels
0	0	25	25 x 2 = 50	0 + 50 = 50

Since we want to find the no.of cars, let's assume there are 0 cars and 25 motorcycles.

Method 2 : Step 2 Keep Guessing

A car park is filled with 25 cars and motorcycles in total. If there are 82 wheels altogether, how many cars are there?

No. of Cars	No. of Wheels (Cars)	No. of Motorcycles	No. of Wheels (Motorcycles)	Total Wheels
0	0	25	25 x 2 = 50	0 + 50 = 50
1	1 x 4 = 4	24	24 x 2 = 48	4 + 48 = 52
2	2 x 4 = 8	23	23 x 2 = 46	8 + 46 = 54

+2

+2

52 - 50 = 2 (Small gap)

When we increase the no of cars by 1 and decrease the no. of motocycle by 1, the total no. of wheels increases by 2 (SMALL GAP).

Method 2 : Step 3

A car park is filled with 25 cars and motorcycles in total. If there are 82 wheels altogether, how many cars are there?

No. of Cars	No. of Wheels (Cars)	No. of Motorcycles	No. of Wheels (Motorcycles)	Total Wheels
0	0	25	25 x 2 = 50	0 + 50 = 50
1	1 x 4 = 4	24	24 x 2 = 48	4 + 48 = 52
2	2 x 4 = 8	23	23 x 2 = 46	8 + 46 = 54
				82

+32

52 - 50 = 2 (Small gap)

82 – 50 = 32 (Big gap)

32 ÷ 2 = 16 (Cars)

Find the BIG GAP. (The gap between what we have in our assumption and what's given in the problem)

Example 2

Susie bought a total of 9 books and pens for $34.
Each book cost $6 and each pen cost $2.
How many books did she buy?

Method 1 : Guess and Check

Susie bought a total of 9 books and pens for $34.
Each book cost $6 and each pen cost $2.
How many books did she buy?

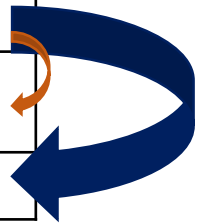
No. of books	Cost of books ($)	No. of pens	Cost of pens ($)	Total cost ($)	Check for $34
5	5 x 6 = 30	4	4 x 2 = 8	30 + 8 = 38	X
6	6 x 6 = 36	3	3 x 2 = 6	36 + 6 = 42	X
4	4 x 6 = 24	5	5 x 2 = 10	24 + 10 = 34	✓

He bought 4 books.

Method 2 : Guess and Check

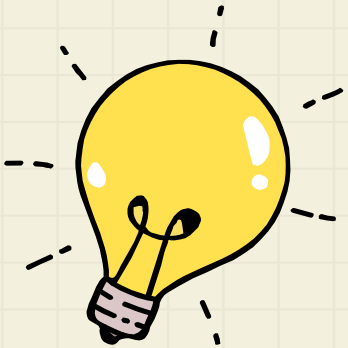
Susie bought a total of 9 books and pens for $34.
Each book cost $6 and each pen cost $2.
How many books did she buy?

No. of books	Cost of books ($)	No. of pens	Cost of pens ($)	Total cost ($)
0	0	9	9 x 2 = 18	0 + 18 = 18
1	1 x 6 = 6	8	8 x 2 = 16	6 + 16 = 22
				34

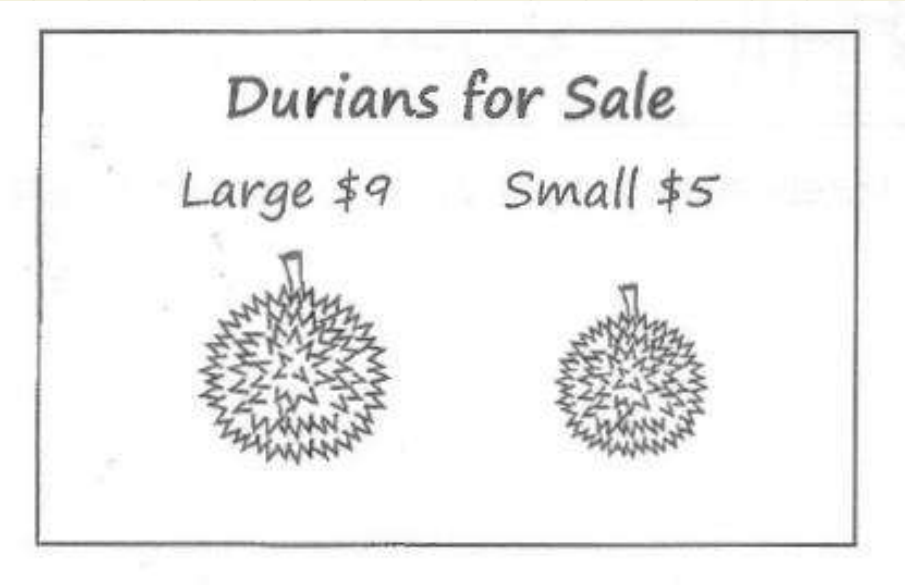


22 - 18 = 4 (Small gap)
34 – 18 = 16 (Big gap)
16 ÷ 4 = 4 (books)

ASSUMPTION METHOD



Meng sold a total of 368 large and small durians at the prices shown below and collected $2760. How many large durians did Meng sell?
(2013/ Paper 2/ 3 marks)



John has a total of ten 50¢ and 20¢ coins. The total amount of the coins is $4.10. How many 20¢ coins does John have?

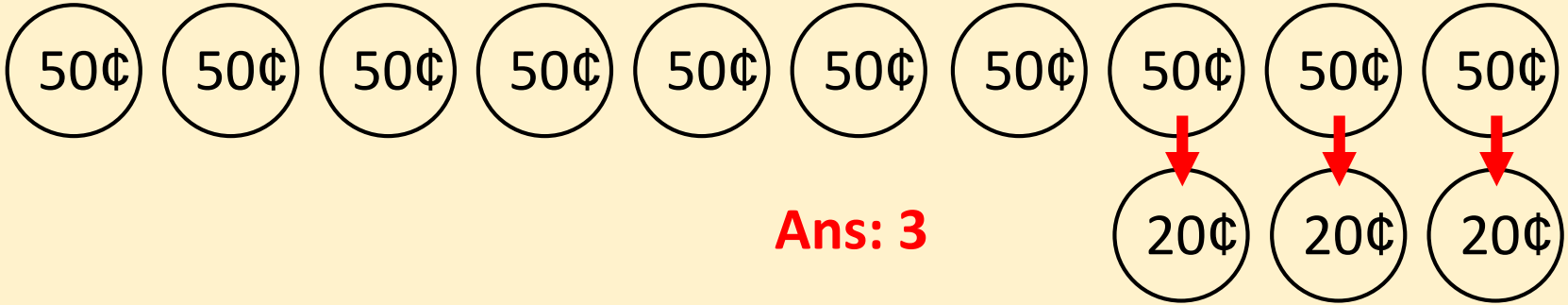
A – Assume — Assume all the coins are 50¢ coins.

M – Multiply — Total Amount → 10 x 50¢ = $5

E – Excess/Shortage — Excess → $5 – $4.10 = 90¢

D – Difference — Diff. between each coin → 50¢ – 20¢ = 30¢

O – Opposite — 90¢ ÷ 30¢ = 3



Ans: 3

John has a total of ten 50¢ and 20¢ coins. The total amount of the coins is $4.10. How many 20¢ coins does John have?

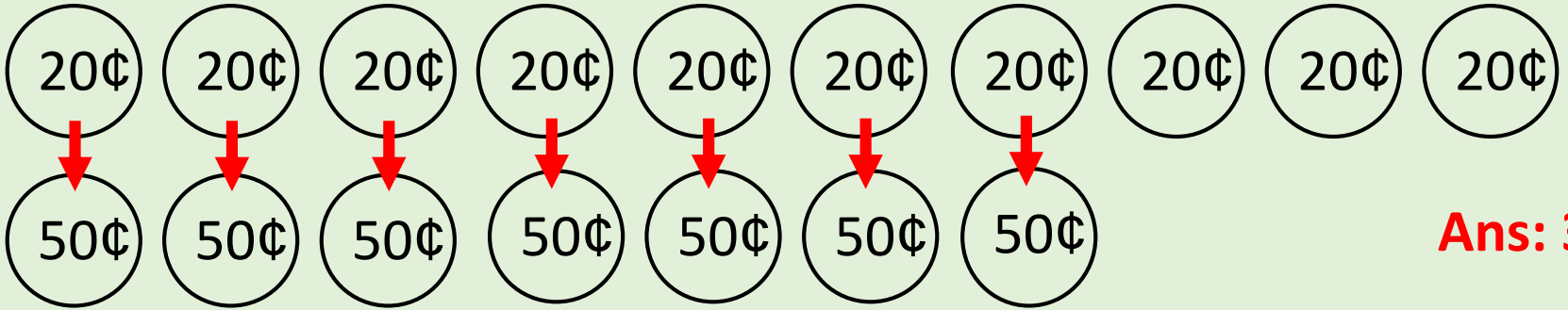
A – Assume — Assume all the coins are 20¢ coins.

M – Multiply — Total Amount → 10 x 20¢ = $2

E – Excess/Shortage — Shortage → $4.10 – $2 = $2.10

D – Difference — Diff. between each coin → 50¢ – 20¢ = 30¢

O – Opposite — $2.10 ÷ 30¢ = 7 10 – 7 = 3



Ans: 3

Meng sold a total of 368 large and small durians at the prices shown below and collected $2760. How many **large** durians did Meng sell? **(2013/ Paper 2/ 3 marks)**

A – Assume

M – Multiply

E – Excess/Shortage

D – Difference

O – Opposite

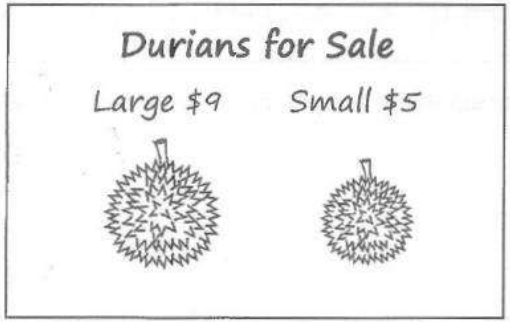
Assume all the durians sold are **small** ones.

Total Amount → 368 x $5 = $1840

Excess → $2760 – $1840 = $920

Diff. between each durian → $9 – $5 = $4

$920 ÷ $4 = 230



Ans: 230

P5/P6/PSLE Examination Format

2018 - First Batch

Standard Mathematics

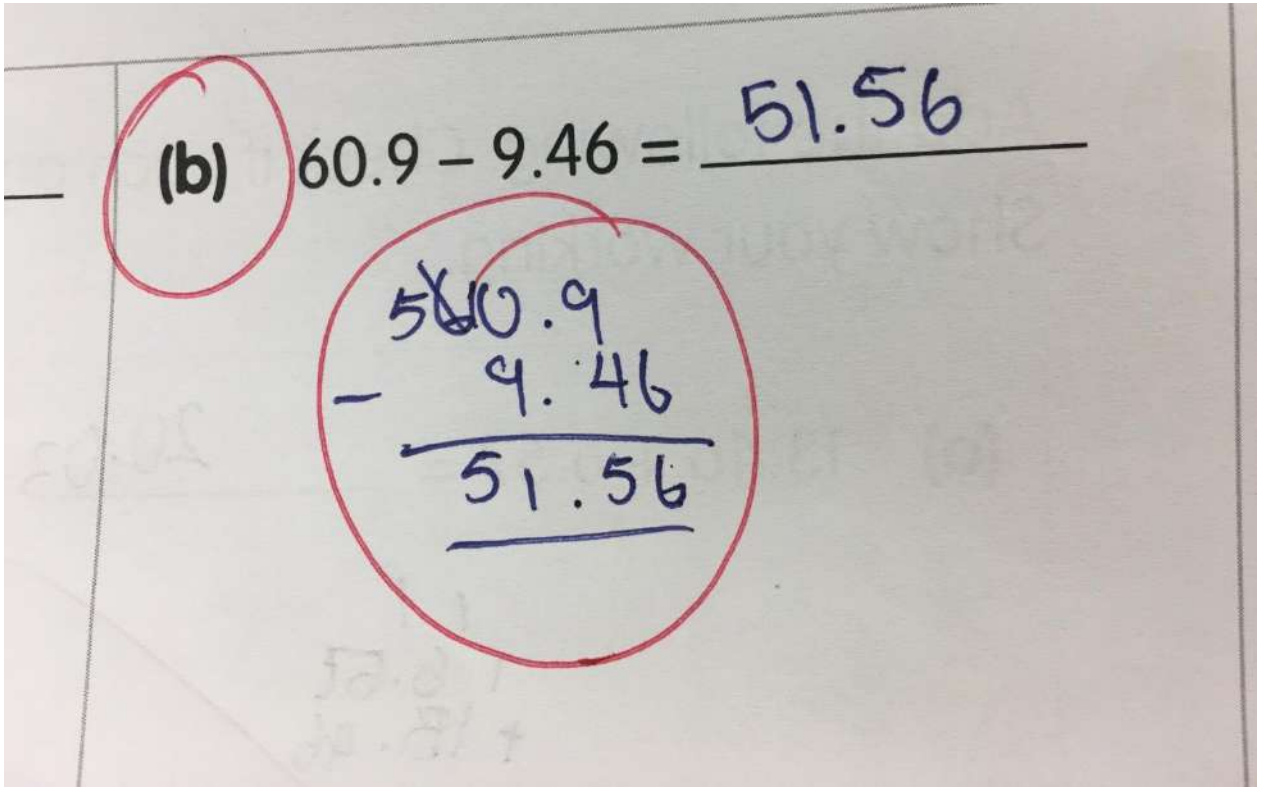
Paper	Booklet	Item Type	Number of questions	Number of marks per question	Total marks	Duration
1	A	Multiple-choice	10	1	10	1 h
			5	2	10	
	B	Short-answer	5	1	5	
			10	2	20	
2		Short-answer	5	2	10	1 h 30 min
		Structured/ Long-answer	12	3, 4 or 5	45	
Total			47	-	100	2 h 30 min

Foundation Mathematics

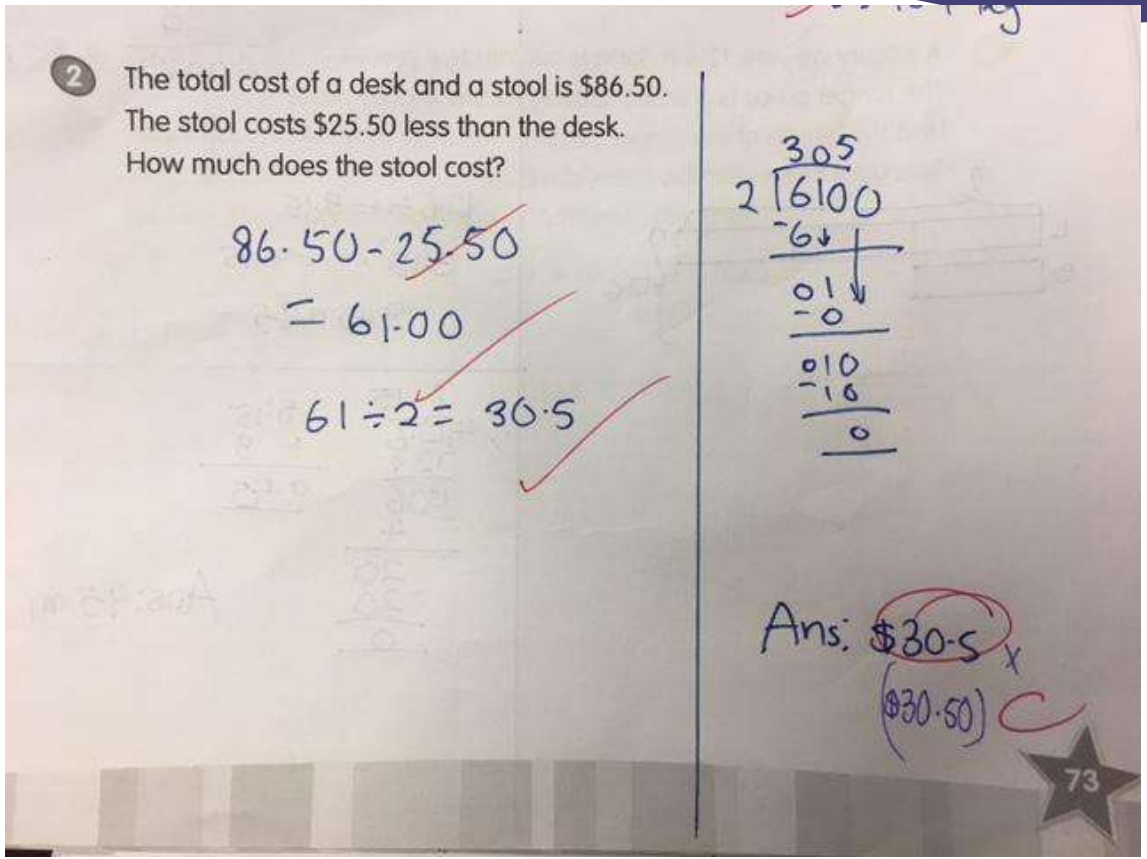
Paper	Booklet	Item Type	Number of questions	Number of marks per question	Total marks	Duration
1	A	Multiple-choice	10	1	10	1 h
			10	2	20	
	B	Short-answer	10	2	20	
2		Short-answer	10	2	20	1 h
		Structured	6	3 or 4	20	
Total			46	-	90	2 h

Misconceptions

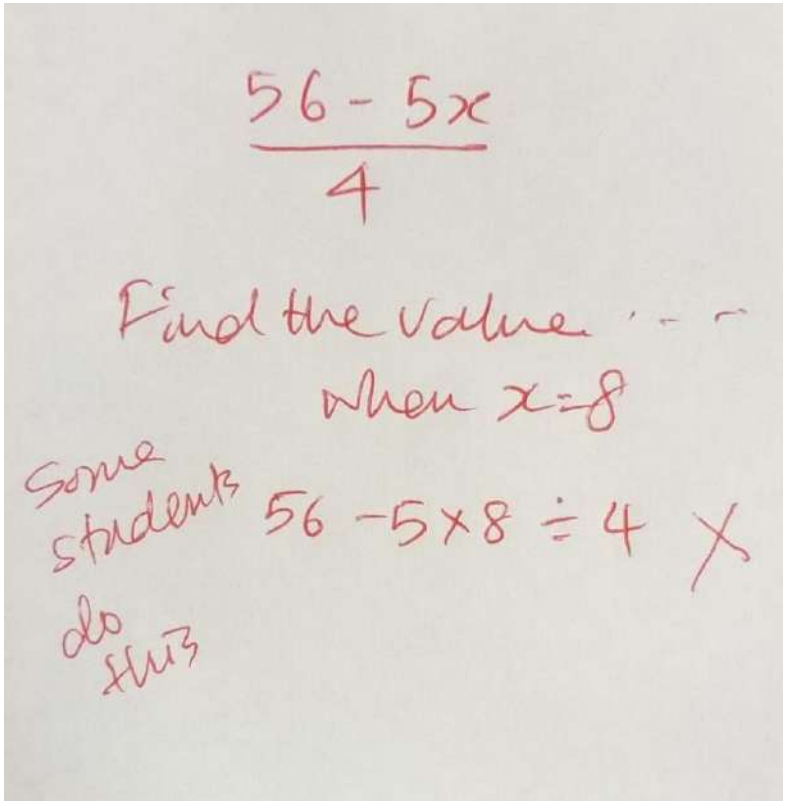
Zero Error

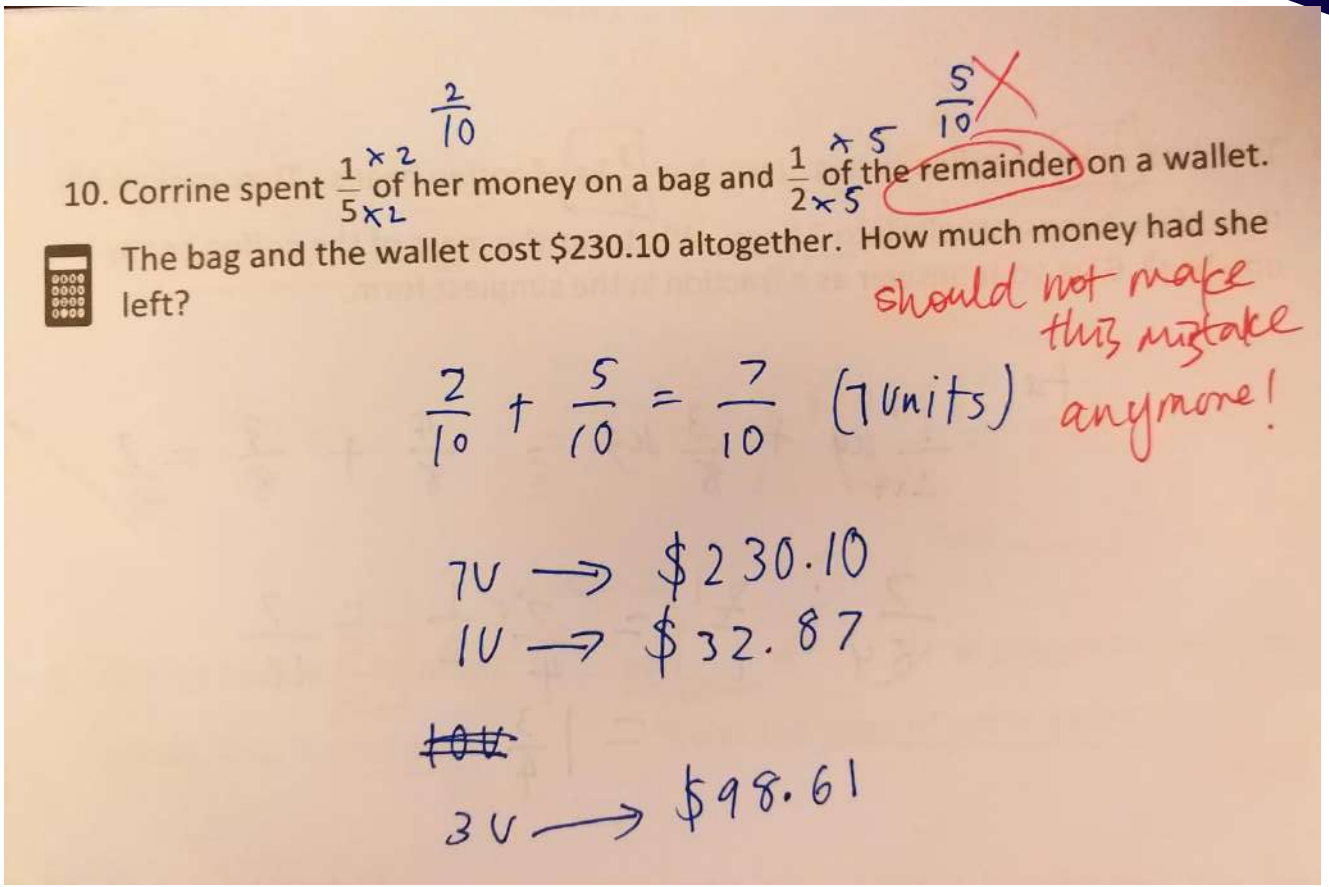


Use of only 1 decimal place for anwers involving $



Four Operations





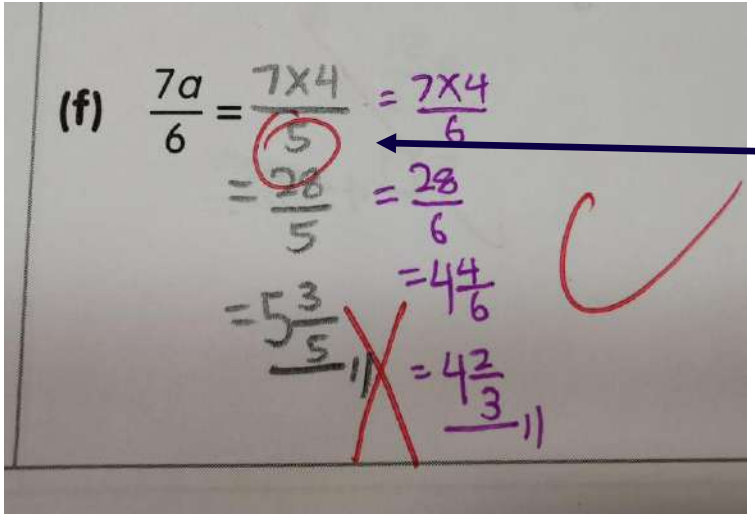
Fractions involving different bases

Common Errors

Types of Common Errors

- Number Transfer error
- Misread
- Not reading the question carefully
- Calculation error
- Doing the wrong operation
- Wrong use of equal sign
- Omission or wrong units
- No labelling of angles

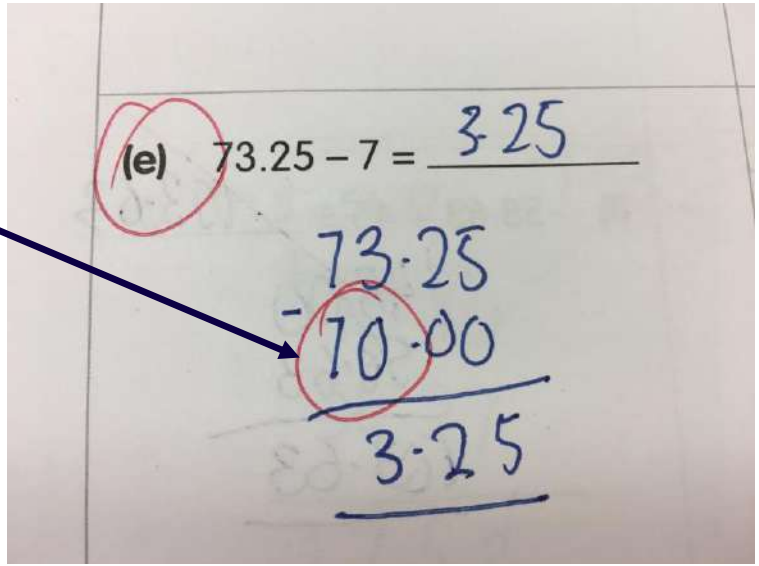
Number Transfer Error



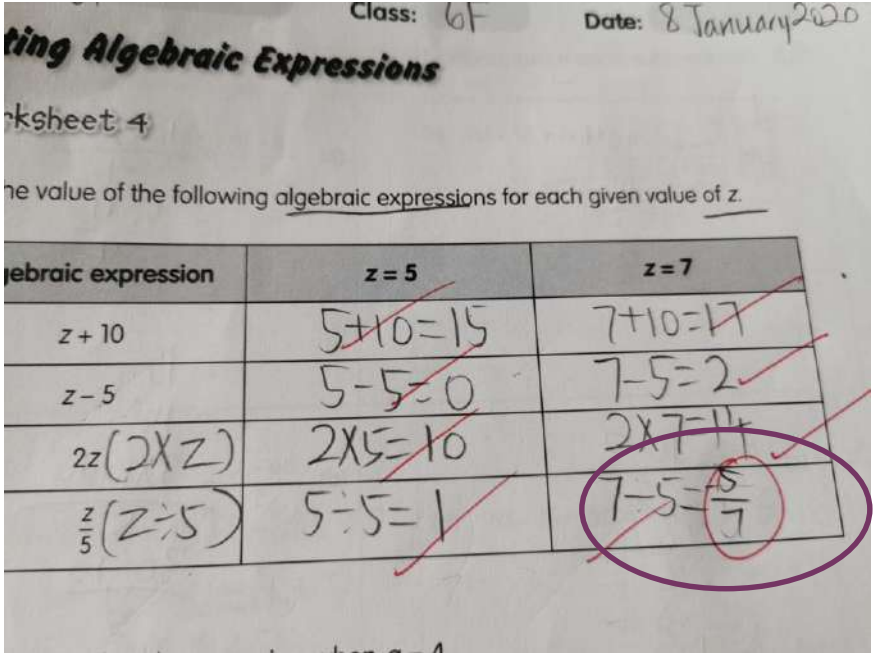
Transfer 5 instead of 6

Misread

Read 70
instead of 7



Wrong Representation of Divison



Class: 6F Date: 8 January 2020

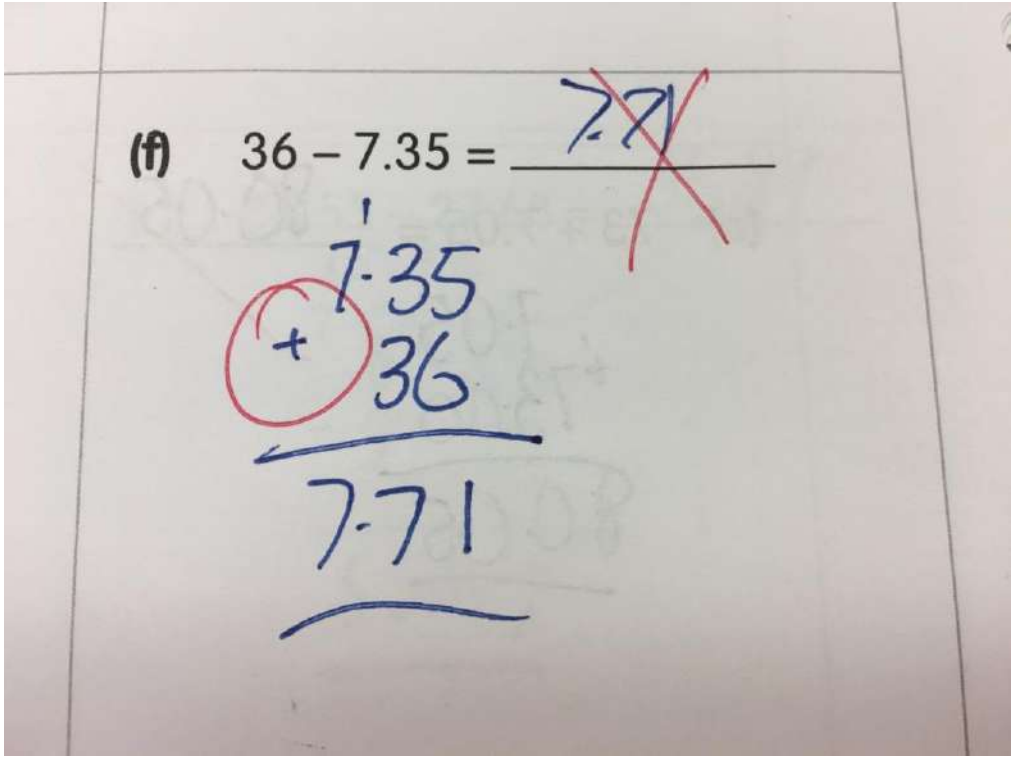
ting Algebraic Expressions

cksheet 4

he value of the following algebraic expressions for each given value of z.

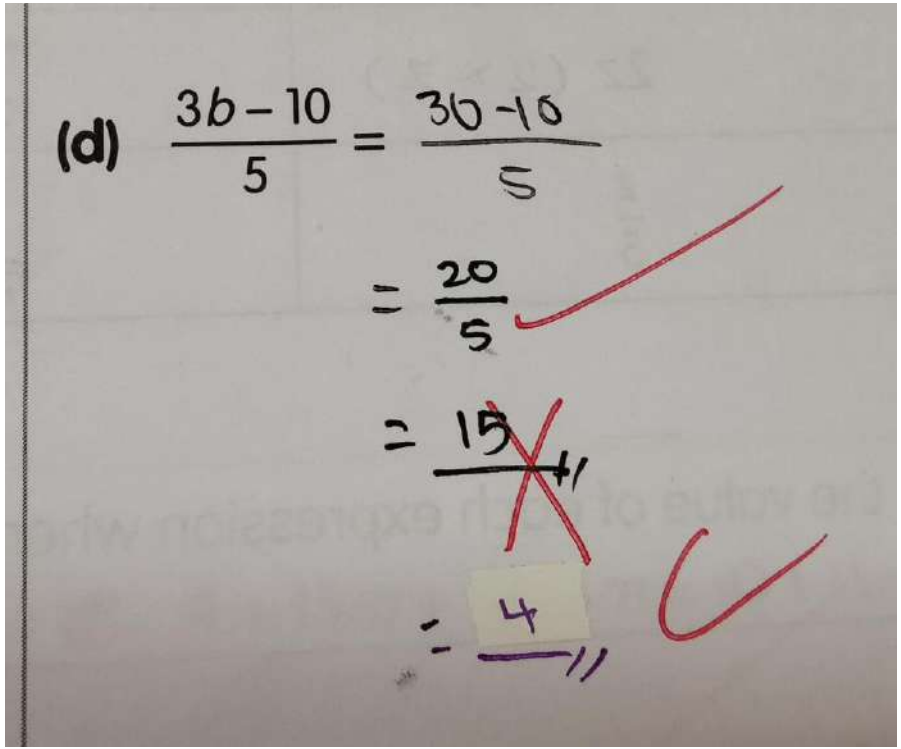
ebraic expression	z = 5	z = 7
$z + 10$	5+10=15	7+10=17
$z - 5$	5-5=0	7-5=2
$2z$ (2XZ)	2X5=10	2X7=14
$\frac{z}{5}$ (Z÷5)	5÷5=1	7-5=$\frac{5}{7}$

Doing Wrong Operation



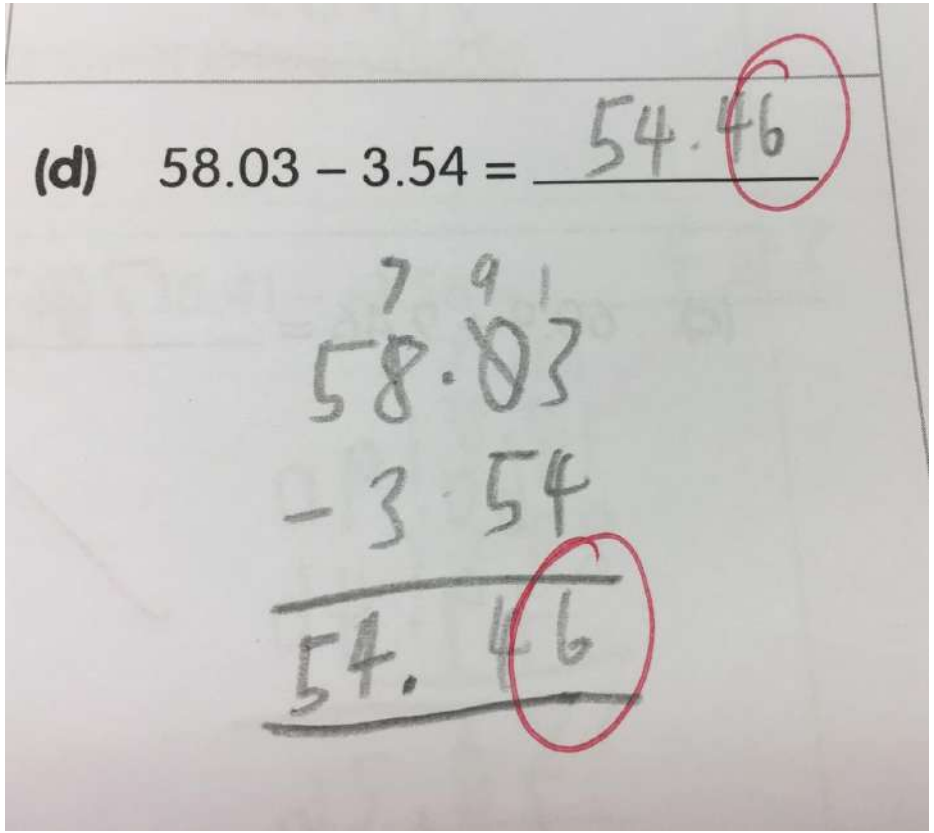
Performing addition instead of subtraction

Doing Wrong Operation

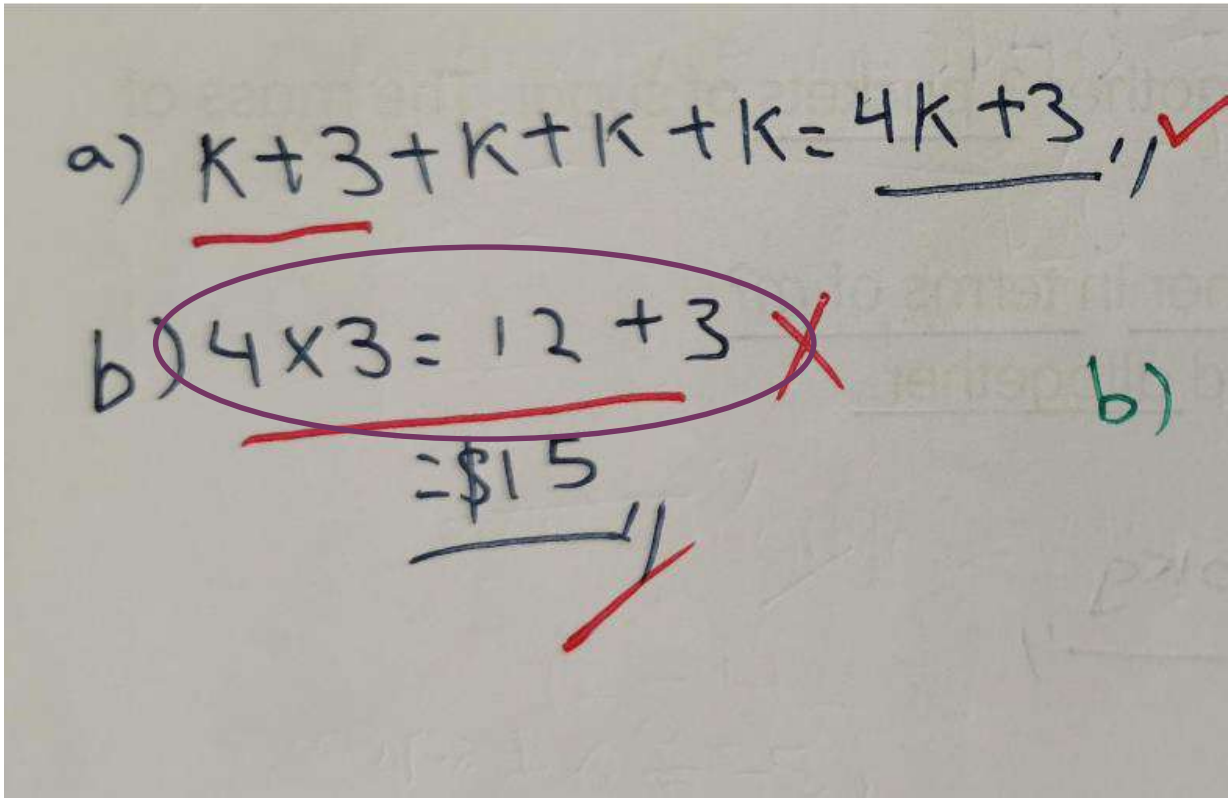


Performing subtraction instead of division

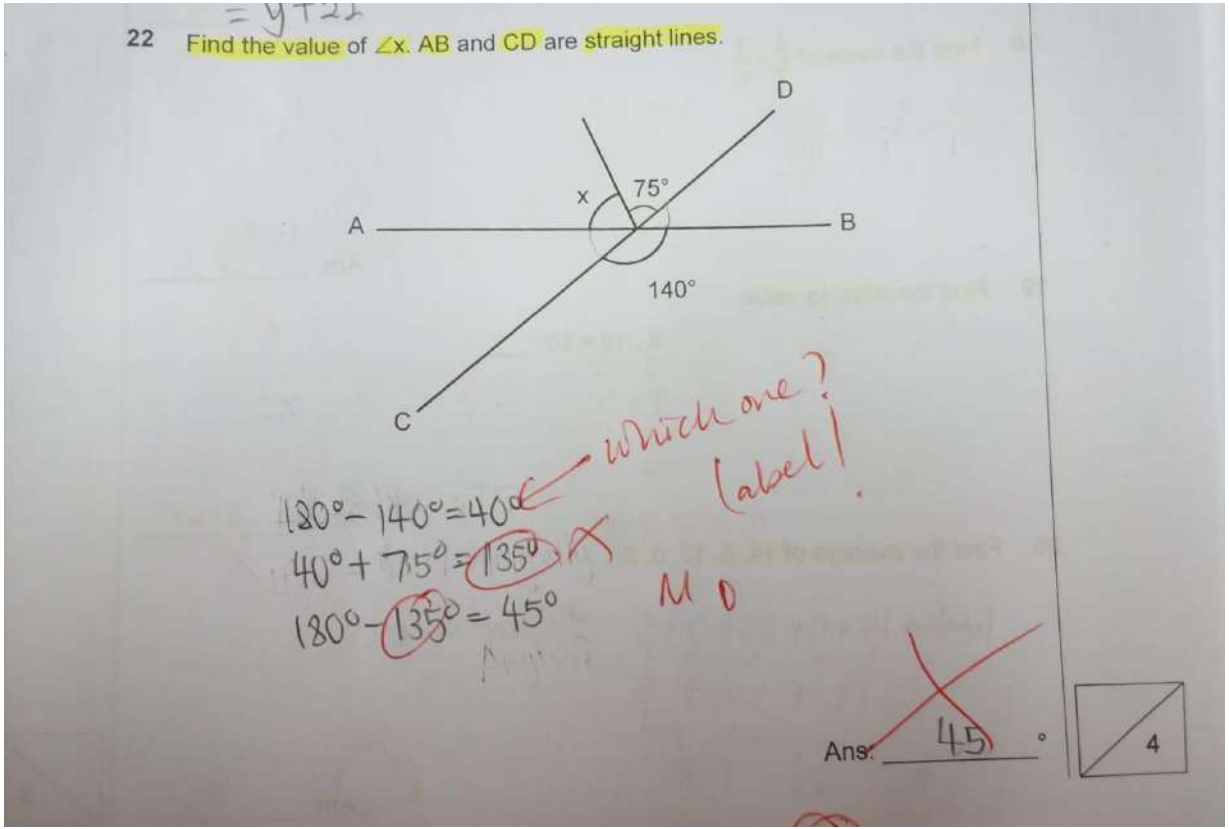
Calculation Error

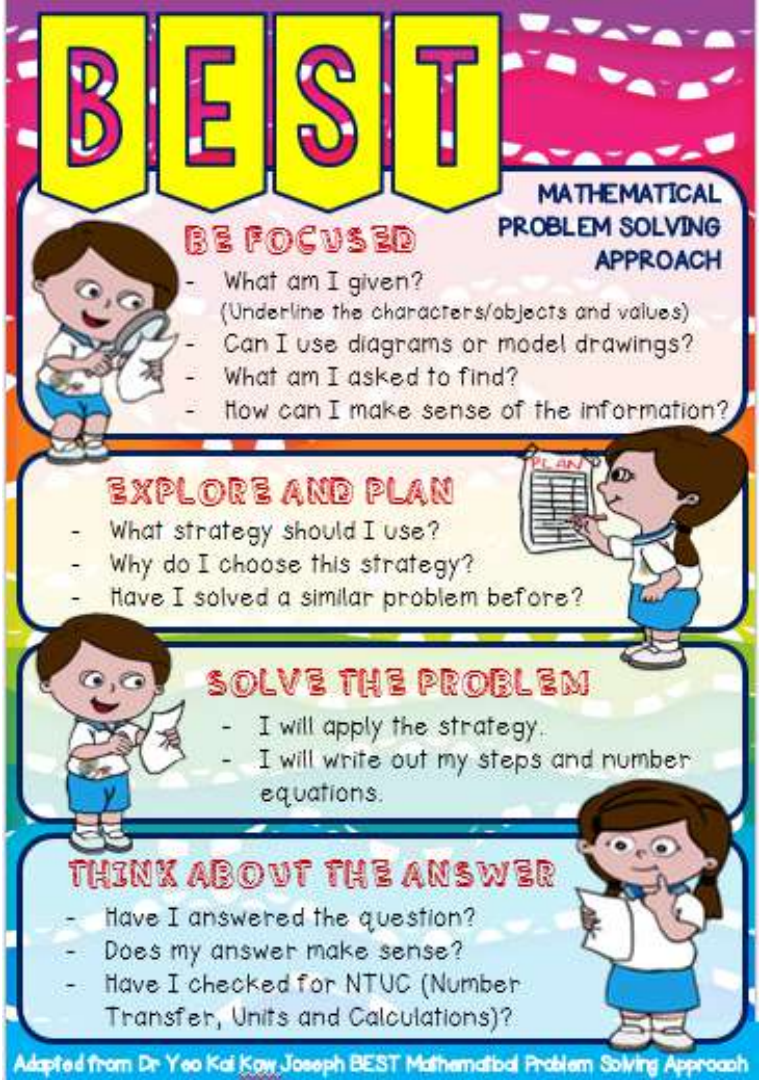


Wrong Use of Equal Sign



No labelling of angles

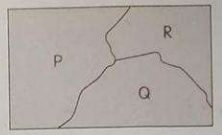




BEST Approach

NTUC to minimize common errors

4 The figure shows a rectangle that is divided into 3 parts, P, Q and R. The ratio of Area Q to Area P is 3 : 4. The ratio of Area R to Area P is 1 : 2. Area Q is 34 cm² bigger than Area R. What is the area of the rectangle?



Q : P R : P
3 : 4 1 : 2
×2 → 2 : 4 ×2

(3 − 2) = 1 unit → 34 cm²

(3 + 4 + 2) = 9 units → 34 cm² × 9
= 306 cm² #

3 34
× 9
306

NT	✓
U	✓
C	✓

cm²

1 There are some red, blue and green buttons. The ratio of the number of red buttons to the number of blue buttons is 4 : 1. The ratio of the number of red buttons to the number of green buttons is 3 : 2. There are 120 more red buttons than green buttons.

(a) What is the ratio of the number of blue buttons to the number of red buttons to the number of green buttons?

(b) How many buttons are there altogether?

(a)

R : B R : G
4 : 1 3 : 2
(12 : 3) (3 : 2)
(12 : 8)

B : R : G
3 : 12 : 8 #

(b)

(12 − 8) = 4 units → 120

1 unit → 120 ÷ 4
= 30

(12 + 8 + 3) = 23 units → 30 × 23
= 690 #

23
× 3
6 9

NT	✓
U	✓
C	✓

buttons

BEST Approach

Dear Parents,

Thank you for taking time to attend the workshop and for partnering us in your child's learning of Mathematics.

We will appreciate your feedback for the workshop.

You may use this link below or the QR code:

https://tinyurl.com/mathws2021

Presenters for the Workshop:

P1 Workshop:

Mdm Angrini
Mdm Faizah
Mrs Poh Kexin
Mrs Jilyn Tan
Mrs Ho-Chan Hui Lin

P3 Workshop:

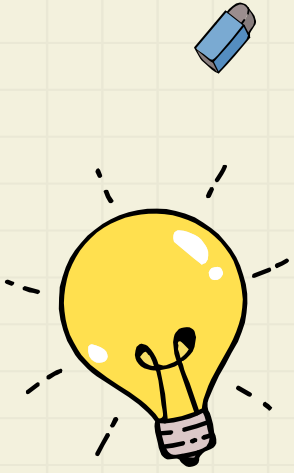
Mrs Prema Suresh
Mrs Jennifer Lam
Mrs Ellis Chua

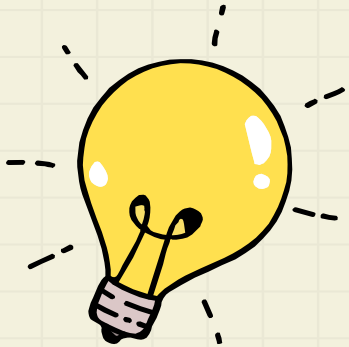
P5 Workshop:

Mrs Lim-Koh Kha Tiang
Mrs Chong Cheng Cheng
Mr Chang Cheng Hwee
Ms Shiamala

Advisor: Mr Goh Shu Rong

Thank you for your time and attention!





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