Parents' Workshop

Mathematics

7 Apr 2018

Examination Format (Standard Mathematics)

Paper 1 (Calculator is not allowed.)

	Type of qns	No. of qns	No. of marks per qn	% weighting
Booklet A	Multiple choice	10	1m	10%
		5	2m	10%
Total		15	20m	20%
Booklet B	Short Answer	5	1m	5%
		10	2m	20%
Total		15	25m	25%
Paper 1		30	45m	45%

Examination Format (Standard Mathematics)

Paper 2 (Calculator is allowed.)

	Type of qns	No. of qns	No. of marks per qn	% weighting
Paper 2	Short Answer	5	2m	10%
	Long Structured	12	3m 4m 5m	45%
Total		17	55m	55%

Use of Calculators

Shift in focus from drill-and-practice to questions requiring explanation

Hence, a deeper understanding of basic concepts is important.

Strategies used:

- **Math Journal**
- **Formative Assessment (FA) – Math journal, Math Talk (discussions in class - informal assessment)**
- **Factual fluency – (first 5 minutes of Math class)**

Factual Fluency

Eg.1 (Order of operations)

$$(40 - 4) \div 9 + 12 \times 3$$

$$= 36 \div 9 + 12 \times 3$$

$$= 4 + 12 \times 3$$

$$= 4 + 36$$

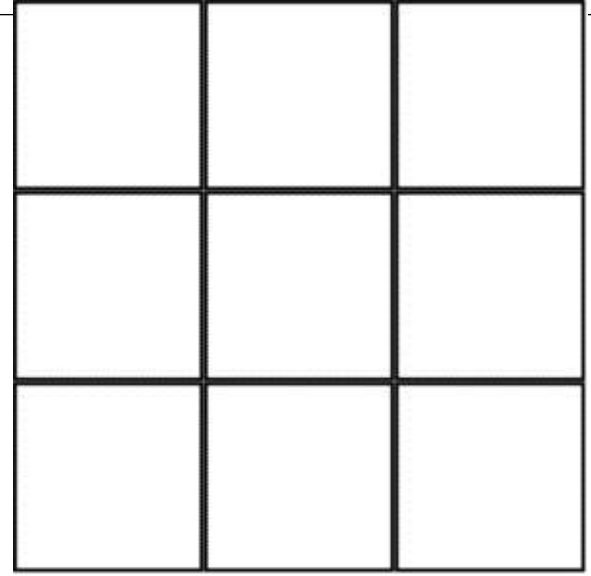
$$= 40$$

Rule for order of operations:

1) Always do bracket first
2) x or ÷ (left to right)
3) + or – (left to right)

Factual Fluency

Eg. 2 (Bingo Game)



How to play :

1) Pupils are to draw 9 squares on their mini whiteboards
2) Teacher would show the answers to the 9 questions to pupils
3) Pupils would randomly fill in the boxes with the answers
4) Teacher would show a question, pupil are to strike off the answer to the question
5) Once a pupil has 3 strikes (diagonal, horizontal, vertical) he/she wins

Let’s Try:

Choose any 9 of these numbers and fill in the boxes.

a) 6000
b) 10
c) 630
d) 1000
e) 460
f) 3000
g) 10 000
h) 640
i) 100
j) 600
k) 300
l) 6400

Questions for teachers:

1) 20 x 30 = 600
2) 567 x 1000 = 567 000
3) 43 x 500 = 43 x 5 x 100
4) 6 x 500 = 3000
5) 23 x 20 = 460
6) 5 x 80 = 40 x 10
7) 5 x 2000 = 10 000
8) 9 x 70 = 630
9) 8 x 800 = 6400

There are many other ways to modify the game:

1) Need to get 4 corners or form the letter 'Z' in order to win
2) Provide fewer than 9 numbers so that students would have to repeat some numbers

The average mass of some children is 45 kg. There is an equal number of boys and girls. The average mass of the boys is 53 kg.

Each statement is either true, false or not possible to tell from the information given.

For each statement, put a tick (✓) in the correct column.

Statement	True	False	Not possible to tell
All the boys are heavier than all the girls.			✓
The average mass of the girls is lighter than 45 kg.	✓		

Math journal

Use diagram or examples to show how the values are different when you

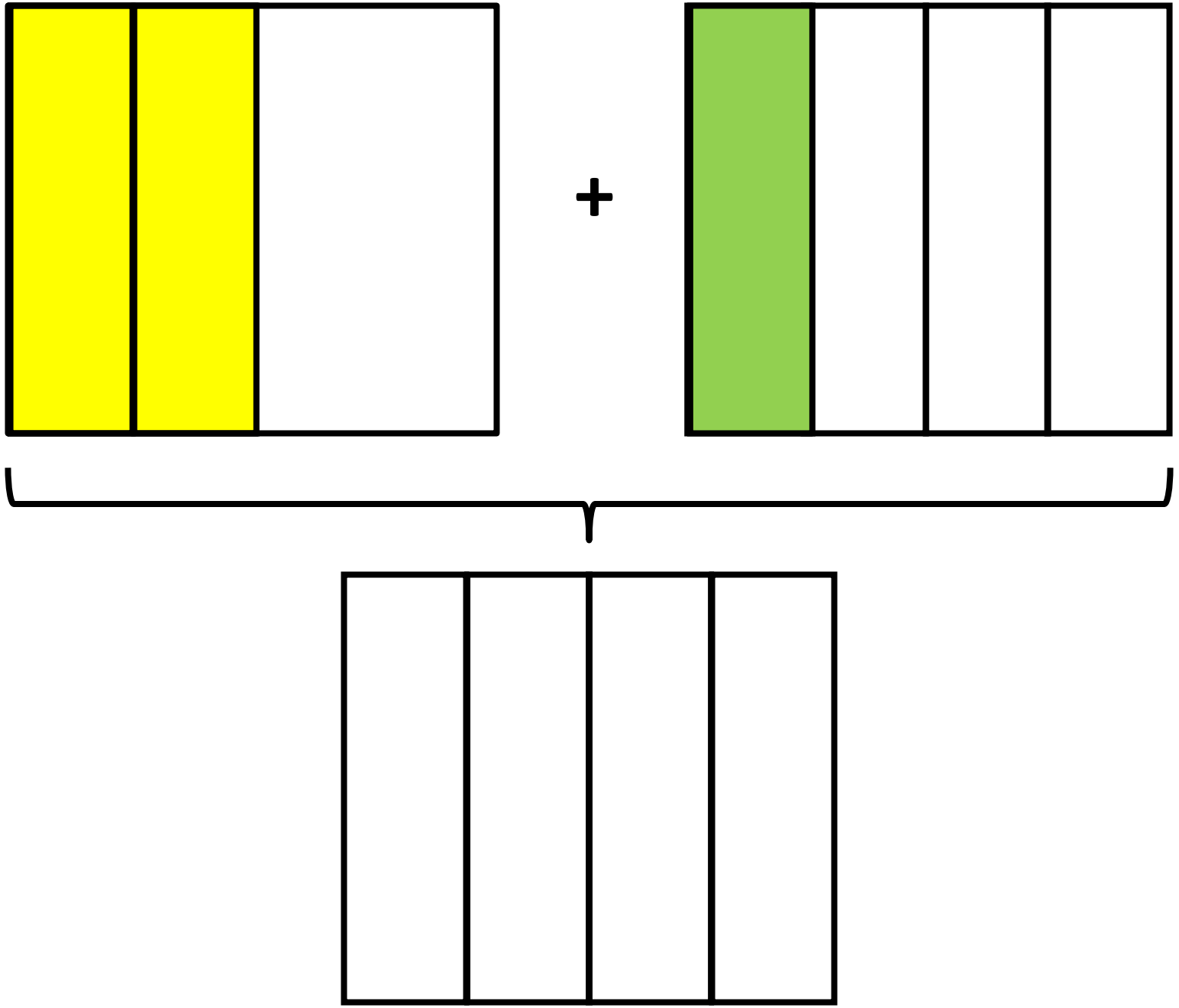
a) add two proper fractions

b) multiply two proper fractions

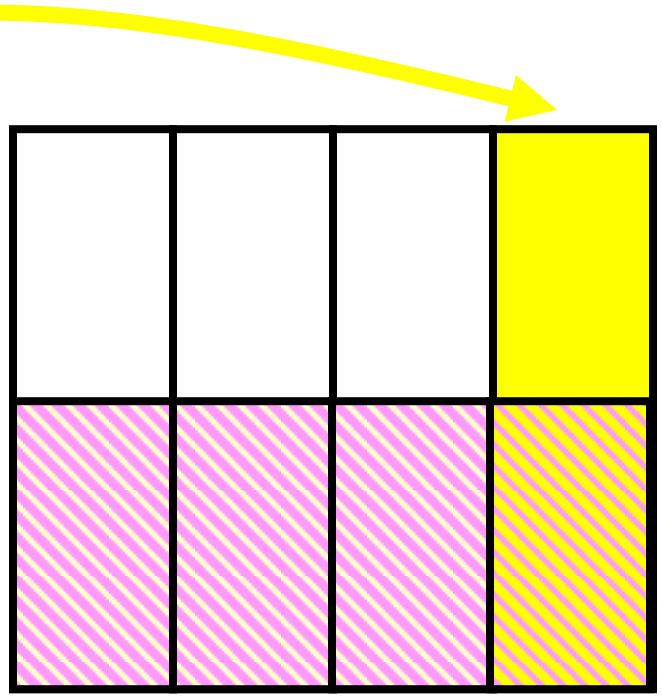
$$\frac{1}{2} + \frac{1}{4}$$

$$= \frac{2}{4} + \frac{1}{4}$$

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



$$\frac{1}{2} \times \frac{1}{4}$$



$$= \frac{1}{8}$$

Eg.4

Use diagram or examples to show how the values are different when you

a) add two proper fractions

b) multiply two proper fractions

<u>Conclusion</u>

Adding two proper fractions is always greater than when multiplying the same two proper fractions.

Other problem solving strategies:

- Model drawing
- Before-after
- Working backwards
- Solving by Assumption (or Guess-and-check)
- Listing in a table
- Draw a diagram (Re-state the problem)
- Pattern Recognition
- Spatial Visualisation

Common area of weakness:

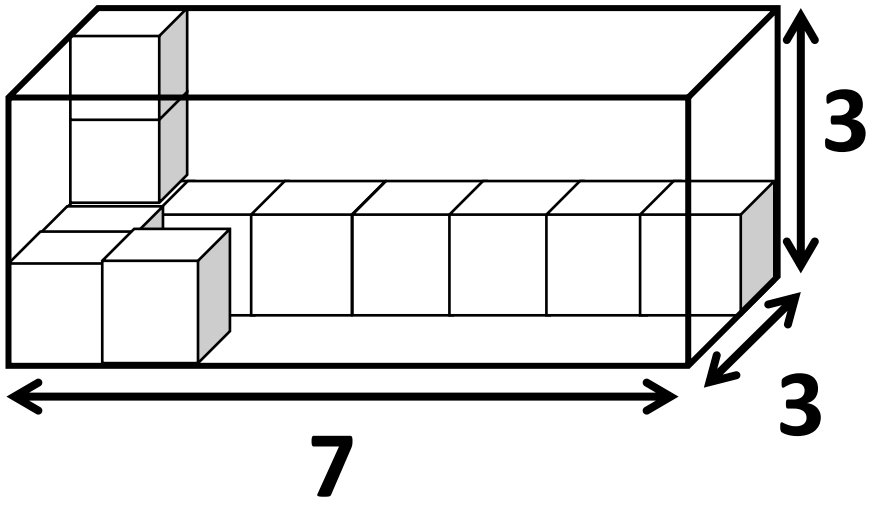
Spatial Visualisation

Topics that require spatial visualisation:

- Volume
- Area and Perimeter
- Geometry
- Symmetry
- Pattern Recognition

Spatial Visualisation

The figure shows a rectangular glass box partly filled with unit cubes. How many more unit cubes are needed to fill the glass box completely?



Now —— 12

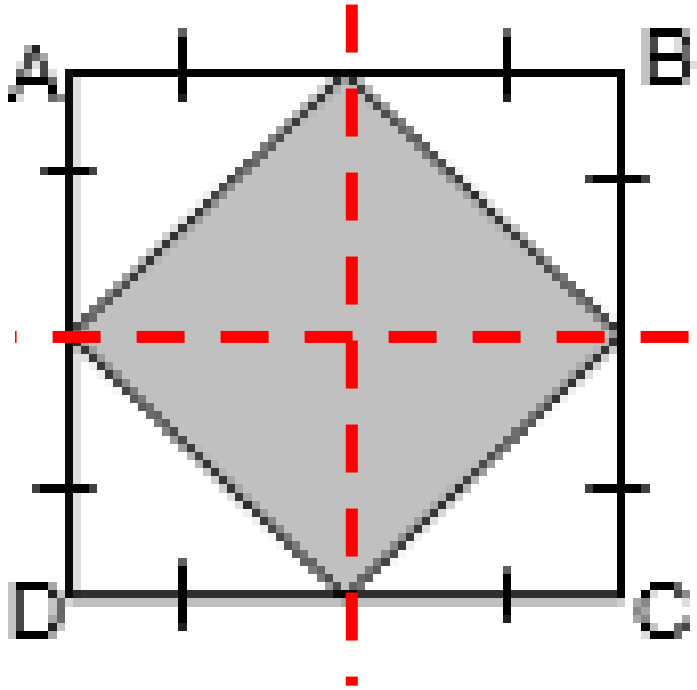
Total —— 7 x 3 x 3 = 63

Need —— 63 – 12 = 51

Ans: 51

Area and Perimeter

ABCD is a square whose perimeter is 264 cm. Find the shaded area.



Length of each side of square

—— **264 ÷ 4 = 66**

Area of square

—— **66 x 66 = 4356**

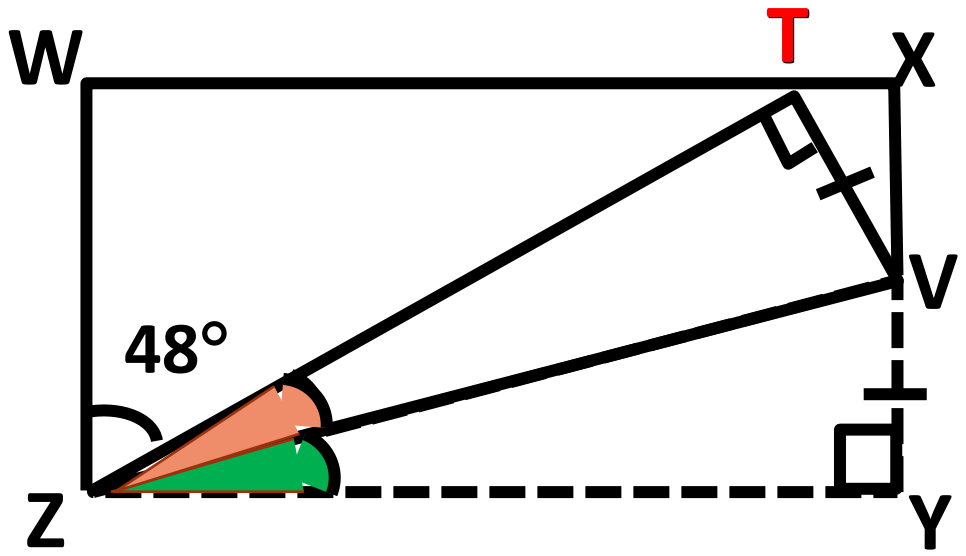
Shaded area

—— **4356 ÷ 2 =2178**

Ans: <u>2178 cm²</u>

Geometry

A rectangular piece of paper is folded as shown. Find ∠TZV.

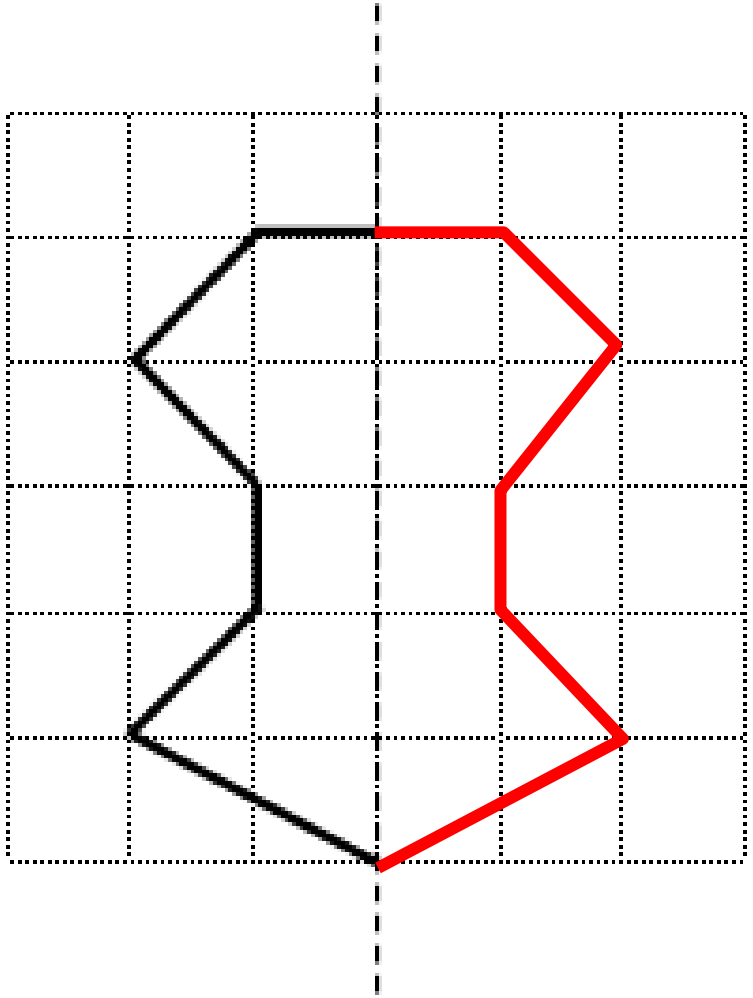


$$\angle TZV \text{ —— } (90° - 48°) \div 2$$

$$= 21°$$

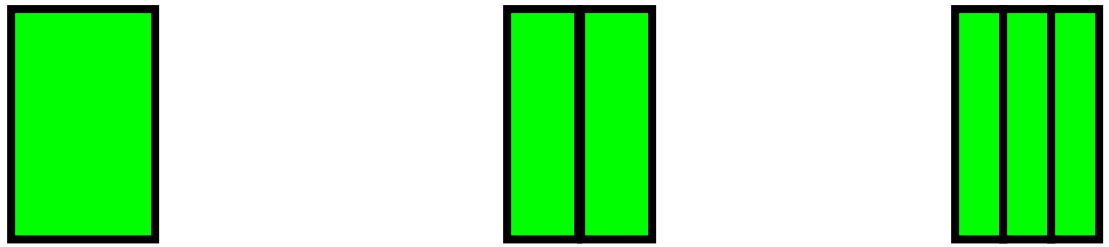
Symmetry

Complete the symmetric figure below with the dotted line as a line of symmetry.



Pattern Recognition

Study the pattern below carefully.



Pattern 1 **Pattern 2** **Pattern 3**

Pattern No.	No. of Rectangles
1	1
2	3
3	6

If the pattern continues, how many rectangles are there in Pattern 6 and Pattern 10?

Pattern No.	No. of Rectangles
1	1
2	1 + 2 = 3
3	1 + 2 + 3 =6
4	1 + 2 + 3 + 4 =10
6	1 + 2 + 3 + 4 + 5 + 6 = 21
10	1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55

Pattern 6 has 21 rectangles.

Pattern 10 has 55 rectangles.

Pattern Recognition

Numbers 1 to 100 were written on a piece of paper. They were arranged in six rows, A, B, C, D, E and F as shown in the diagram below.

The piece of paper was torn and ony one portion of it remained. In which row was the number 77 written?

Row A	1	7	13	19	25	31
Row B	2	8	14	20	26	
Row C	3	9	15	21		
Row D	4	10	16	22		
Row E	5	11	17	23		
Row F	6	12	18	24		

A freight company transported 500 boxes for Linda. It charged $7 for every box safely transported and it had to pay Linda $18 for every damaged box. Linda paid a total of $3225. How many boxes were transported safely?

Safe		Damaged		Total amount
No.	Amount	No.	Amount	
500	$3500	0	$0	$3500
499	$3493	1	$18	$3475
490	$3450	10	$180	$3250
489	$3423	11	$198	$3225

A freight company transported 500 boxes for Linda. It charged $7 for every box safely transported and it had to pay Linda $18 for every damaged box. Linda paid a total of $3225. How many boxes were transported safely?

Amount lost for one damaged box —— $7 + $18
= $25

If all delivered safely —— 500 x $7
= $3500

Loss —— $3500 – $3225
= $275

No. of damaged boxes —— $275 ÷ $25
= 11

No. of boxes transported safely —— 500 – 11
= 489

Check

No. of damaged boxes —— 11

No. of undamaged boxes —— 489

Amount paid —— 489 x $7 – 11 x $18

= $3423 - $198

= $3225

Use of equal sign

3 units = 42 ✓

3 units —— 42 ✓

30% = 42 ✗

30% = 0.3 and not 42

0.3 = 42 ✗

$\frac{1}{3}$ = 42 ✗

30% —— 42 ✓

0.3 —— 42 ✓

$\frac{1}{3}$ —— 42 ✓

a long dash means “represent”
(Draw a longer line to avoid having it look like a minus sign.)

Evolution Era:

Mathematics is not just about memorising formulae or working out mechanical sums.

We need to train students to use logical thinking and reasoning skills to understand and solve a problem.

We also need to train them to use the right mathematical terms to communicate when they explain mathematical concepts.

Thank You