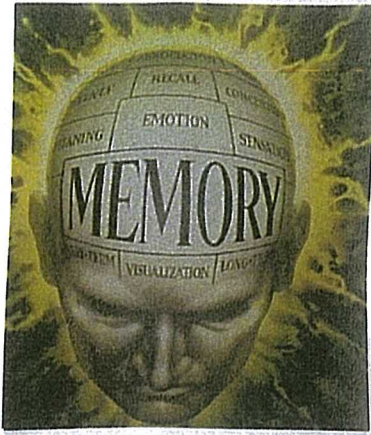


MATH & MEMORY



BARK'S DISCOVERY

METHOD

BOOK 1

FOR PRIMARY SCHOOLS

FREE RANGE LEARNING

THE **3RS** THE PROFESSIONAL WAY

ARK's Discovery Method

FOR

PRIMARY MATHS

A. BARK. The 3Rs The Professional Way

NATIONAL LIBRARY OF AUSTRALIA

ISBN 0 949384 14 3

© Aarl Bark, 2017

LEARNING BY EXAMPLE 1.

GIVEN

GIVEN

TASK

$$9+6$$

5 TEEN

$$9+8$$

7 TEEN

$$9+5$$

RECIPE - 8 ANSWERS!

1	2	3	4		6		8		
11	12			15		17		19	20
	22	23	24		26		28		
31		33	34	35		37			40
41			44		46		48		
51	52		54		56	57		59	60
61		63		65		67	68	69	
71	72	73	74		76		78		80
81		83	84	85		87		89	
91	92		94		96		98		100
101		103		105		107		109	
201	202		204		206		208		210
301		303		305		307		309	
401	402		404		406		408		410
2		6		10					20
1		5		9		13			19

$3+1=4$

$1+3=4$

$72+1$

$85+1$

$2+5=7$

$5+2=7$

$2+17$

$79+2$

$2+4=6$

$6+2=8$

$2+32$

$88+2$

$1+8=9$

$2+7=9$

$3+6=9$

SE FOUR NEXT DOOR

$5+4=9$

$8+1=9$

$7+2=9$

$6+3=9$

$4+5=9$

THE 9-PARTNERS

$1 \text{ \& } 8$

$2 \text{ \& } 7$

$3 \text{ \& } 6$

$5 \text{ \& } 4$

MEMORISE!

VISUALISE

$11+8$

$37+2$

$46+3$

$54+5$

$65+4$

$93+6$

$82+7$

$78+1$

THE FIRST 9-RECIPE

$6+9$

5 TEEN

$7+9$

6 TEEN

$8+9$

7 TEEN

$9+9$

8 TEEN

$2+9$

$5+9$

$4+9$

$3+9$

THE SECOND 9-RECIPE

$23+9$

32

$49+9$

58

$54+9$

63

$32+9$

41

$34+9$

$46+9$

$85+9$

$27+9$

$39+4$

4 3

$49+6$

5 5

$89+5$

9 4

$29+7$

3 6

$29+2$

$39+3$

$49+4$

$59+5$

THE 10-PARTNERS

$2+8=10$	$3+7=10$	$4+6=10$	$5+5=10$
----------	----------	----------	----------

$2 \text{ \& } 8$

$3 \text{ \& } 7$

$4 \text{ \& } 6$

$5 \text{ \& } 5$

MEMORISE

$14+6=20$	$35+5=40$	$42+8=50$	$51+9=60$
-----------	-----------	-----------	-----------

$42+8$

$57+3$

$96+4$

$914+6$

$9+10$

$8+10$

$2+10$

$3+10$

9 TEEN

8 TEEN

$14+10$

$39+10$

$51+10$

$71+10$

24

49

DOUBLES

3	6
-----	-----

6	12
-----	------

4	8
-----	-----

7	14
-----	------

5	10
-----	------

8	16
-----	------

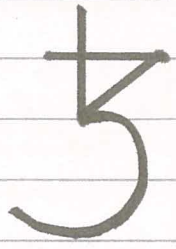
HALVES

HALF 8	4
--------	-----

HALF 9	$4\frac{1}{2}$
--------	----------------

DO HALF 8

ADD $\frac{1}{2}$

$11\ 3+3=6$ $3+4=7$		$11\ 5+5=10$ $5+6=11$	DOUZE (FR) DOZEN $11\ 6+6=12$ $6+7=$
$11\ 7+7=14$ $7+8=$	FOUR SEVEN ELEVEN	$11\ 4+7=11$ $5+7=$	$11\ 4+7=$ $4+8=$
$11\ 4+7=$ $3+8=$	8 6 $14 \downarrow$	$3 + 5 = 8$ $5 + 8 = 13$	
$15+7$ $\underline{12}$ $2\ 2$ SAY TWENTY-TWO	$17+8$ $\underline{15}$ 25	$26+8$	$37+6$
$44+7$	$54+8$	$63+8$	$72+9$
$83+9$	$94+9$	$25+9$	$36+9$
$14+6$	$21+9$	$32+8$	$43+7$

21	20	22	22	20	24
24	20	23	20	21	25
20	27	25	20	22	24
26	22	28	26	24	21
23	25	22	24	20	22
23	26	23	21	22	23
21	21	21	23	21	25
27	20	43	54	43	56

12+9	16+4	15+7	16+6	17+3	15+9
16+8	14+6	17+6	18+2	17+4	18+7
12+8	18+9	17+8	13+7	17+5	18+6
19+7	19+3	19+9	18+8	17+7	15+6
18+5	16+9	18+4	19+5	11+9	14+8
16+7	17+9	15+8	14+7	13+9	19+4
16+5	13+8	18+3	14+9	19+2	19+6
19+8	15+5	39+4	45+9	26+17	38+18

SEE

$$21 + 35 = 56$$

START
50

SAY FIFTY-SIX

13

SEE

$$34 + 49 = 83$$

70

SAY

EIGHTY-THREE

$$21 + 9 \quad 23 + 8 \quad 26 + 5 \quad 37 + 8 \quad 42 + 8 \quad 33 + 9$$

$$33 + 19 \quad 46 + 17 \quad 58 + 13 \quad 33 + 17 \quad 44 + 17 \quad 36 + 16$$

$$47 + 19 \quad 64 + 16 \quad 54 + 18 \quad 56 + 18 \quad 68 + 14 \quad 55 + 15$$

$$24 + 19 \quad 27 + 14 \quad 28 + 16 \quad 26 + 14 \quad 25 + 17 \quad 26 + 19$$

$$38 + 25 \quad 37 + 23 \quad 35 + 26 \quad 37 + 26 \quad 38 + 27 \quad 38 + 29$$

$$48 + 32 \quad 105 + 9 \quad 47 + 35 \quad 48 + 39 \quad 49 + 32 \quad 45 + 38$$

$$57 + 13 \quad 56 + 14 \quad 57 + 27 \quad 56 + 34 \quad 65 + 25 \quad 72 + 19$$

$$83 + 9 \quad 74 + 19 \quad 65 + 29 \quad 76 + 19 \quad 85 + 15 \quad 73 + 27$$

8.

IN 60 SECONDS
SAY OUT LOUD!

30	31	31	45	50	42
52	63	71	50	61	52
66	80	72	74	82	70
43	41	44	40	42	45
63	60	61	63	65	67
80	114	82	87	81	83
70	70	84	90	90	91
92	93	94	95	100	100

SOMEBODY TO CHECK 9 CONTINUE ONLY WHEN SCORE IS 100%

ALGORITHMS

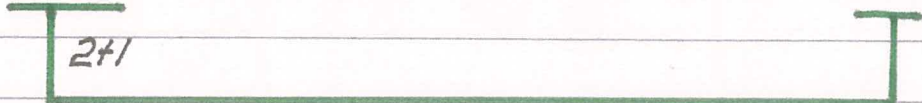
$\begin{array}{r} \downarrow \text{START} \\ 34 \\ + 52 \\ \hline 86 \end{array}$	$\begin{array}{r} 46 \\ + 33 \\ \hline \end{array}$	$\begin{array}{r} 74 \\ + 15 \\ \hline \end{array}$
$\begin{array}{r} 29 \\ + 37 \\ \hline 66 \end{array}$	<p style="text-align: center;">CHECK WITH CALCULATOR</p> <p style="text-align: center;">THE RELAY METHOD</p> $\begin{array}{r} \swarrow 15 \\ 37 \\ + 8 \\ \hline 45 \end{array}$ <p style="text-align: center;">NOT PLUS ↓ 7 & 8 's 15 put down THE 5, carry the 1 & 3 is 4</p>	<p style="text-align: center;">WITH</p> <p style="text-align: center;">VERBAL REHEARSAL</p> <p style="text-align: center;">SAY & DO</p>
$\begin{array}{r} 73 \\ + 29 \\ \hline \end{array}$	<h2>NUMBER FLUENCY</h2>	
$\begin{array}{r} 64 \\ + 88 \\ \hline \end{array}$	<p style="text-align: center;">SEE</p> $7+8$ $7+8=15$ <p style="text-align: center;">NOT "Plus" !!</p>	<p style="text-align: center;">SAY</p> $7'n8$ $7'n8 \rightarrow 15$ <p style="text-align: center;">NOT "Equals" !!!</p>

MATHS & MEMORY

THE 9-REMAINDER

$$21 = (2 \times 9) + 3$$

(Note: '18' is written above the '9' in the original image)



∴ (THEREFORE)

$11 - 9 = 2$

$14 - 9 =$

$12 - 9 = 3$

$15 - 9 =$

$13 - 9 = 4$

$17 - 9 =$

REDUCING A NUMBER TO 1 DIGIT MEANS FINGER!

$31 \text{ BECOMES } 4$

$53 \text{ BECOMES } 8$

$878 \text{ BECOMES } 23 \text{ BECOMES } 5$


$46 \xrightarrow{\text{BECOMES}} 10 \rightarrow 1$

$123 \xrightarrow{\text{BECOMES}}$

IGNORE 9

$18 \rightarrow 9 \rightarrow 0$

$456 \rightarrow$

$5 \text{ } \underline{27} \text{ } \underline{36} \rightarrow 23 \rightarrow 5$ 

$35 \rightarrow 8$

$789 \rightarrow$

MATHS & MEMORY

CHECKING ANSWERS

21	3	725	5	15		373
+37	+1	+367	+7	+26		+484
58	4	1092	3			
13						

3	SAY ALoud	4	10	83	START	74
5	8	6	17	75	8	63
6	14	7	23	66	14	57
7	21	8	28	57	21	42
8	29	9	31	38	29	31
+9		3	33	+20	29	+25
38				33	9	

EVENTUALLY SILENTLY
WITHOUT CRUTCH FIGURES

REVISION 60 SECONDS

$$\underline{2+11}$$

$$\underline{2+23}$$

$$\underline{2+35}$$

$$\underline{2+47}$$

$$\underline{2+59}$$

$$\underline{13+4}$$

$$\underline{210+5}$$

$$\underline{2+72}$$

$$\underline{2+24}$$

$$\underline{2+36}$$

$$\underline{2+48}$$

$$\underline{25+6}$$

$$\underline{14+6}$$

$$\underline{21+9}$$

$$\underline{5+5}$$

$$\underline{42+8}$$

$$\underline{57+3}$$

$$\underline{36+7}$$

$$\underline{11+8}$$

$$\underline{22+7}$$

$$\underline{33+6}$$

$$\underline{45+4}$$

$$\underline{54+5}$$

$$7+8$$

$$9+3$$

$$4+9$$



$$9+5$$



$$6+9$$



$$9+7$$



$$8+9$$



$$19+9$$



$$28+9$$



$$37+9$$



$$49+6$$



$$59+5$$



$$\underline{47+7}$$

$$\underline{58+8}$$

$$\underline{4+7}$$

$$5+7$$

$$\underline{14+7}$$

$$3+8$$

$$4+8$$

$$25+7$$

$$\underline{8+6}$$

$$\underline{28+6}$$

$$3+5$$

$$5+8$$

$$13+5$$

$$15+8$$

$$13+15$$

Consciously

USE THE RECIPES

YOU

LEARNED

MATHS & MEMORY 30 sec.

EYES

$$\begin{array}{r} 21+9 \\ \hline 20+10 \end{array}$$

$$\begin{array}{r} 44+7 \\ \hline 40+11 \end{array}$$

$$\begin{array}{r} 77+4 \\ \hline 70+11 \end{array}$$

$$\begin{array}{r} 98+7 \\ \hline 90+15 \end{array}$$

$$\begin{array}{r} 23+8 \\ \hline 20+11 \end{array}$$

$$\begin{array}{r} 36+6 \\ \hline 30+12 \end{array}$$

$$\begin{array}{r} 88+6 \\ \hline 80+14 \end{array}$$

$$\begin{array}{r} 98+2 \\ \hline 90+10 \end{array}$$

$$\begin{array}{r} 26+5 \\ \hline 20+11 \end{array}$$

$$\begin{array}{r} 47+9 \\ \hline 40+16 \end{array}$$

$$\begin{array}{r} 86+4 \\ \hline 80+10 \end{array}$$

$$\begin{array}{r} 105+9 \\ \hline 100+14 \end{array}$$

$$\begin{array}{r} 37+8 \\ \hline 30+15 \end{array}$$

$$\begin{array}{r} 64+6 \\ \hline 60+10 \end{array}$$

$$\begin{array}{r} 85+7 \\ \hline 80+12 \end{array}$$

$$\begin{array}{r} 87+5 \\ \hline 80+12 \end{array}$$

$$\begin{array}{r} 42+8 \\ \hline 40+10 \end{array}$$

$$\begin{array}{r} 54+8 \\ \hline 50+12 \end{array}$$

$$\begin{array}{r} 66+9 \\ \hline 60+15 \end{array}$$

$$\begin{array}{r} 38+9 \\ \hline 30+17 \end{array}$$

$$\begin{array}{r} 33+9 \\ \hline 30+12 \end{array}$$

$$\begin{array}{r} 56+8 \\ \hline 50+14 \end{array}$$

$$\begin{array}{r} 78+5 \\ \hline 70+13 \end{array}$$

$$\begin{array}{r} 89+1 \\ \hline 80+10 \end{array}$$

$$\begin{array}{r} 46+7 \\ \hline 40+13 \end{array}$$

$$\begin{array}{r} 68+4 \\ \hline 60+12 \end{array}$$

$$\begin{array}{r} 77+3 \\ \hline 70+10 \end{array}$$

$$\begin{array}{r} 95+8 \\ \hline 90+13 \end{array}$$

$$\begin{array}{r} 58+3 \\ \hline 50+11 \end{array}$$

$$\begin{array}{r} 55+5 \\ \hline 50+10 \end{array}$$

$$\begin{array}{r} 75+6 \\ \hline 70+11 \end{array}$$

$$\begin{array}{r} 27+7 \\ \hline 20+14 \end{array}$$

REVISION 2

30 SECONDS

$12+19$ $20+11$	$17+15$ $20+12$	$13+18$ $20+11$	$16+17$ $20+13$
$26+15$ $30+11$	$27+18$ $30+15$	$28+19$ $30+17$	$29+16$ $30+15$
$27+29$ $40+16$	$28+28$	$29+22$	$28+27$
$36+16$ $40+12$	$25+17$	$39+18$	$38+15$
$38+24$ $50+12$	$36+28$	$39+24$	$37+27$
$46+19$ $50+15$	$45+16$	$44+17$	$49+17$
$47+26$ $60+13$	$45+29$	$49+23$	$44+28$
$53+39$ $80+12$	$57+34$	INCREASE $59 \text{ BY } 35$ $= 59 + 35$	DECREASE $59 \text{ BY } 35$ $= 59 - 35$

MATHS & MEMORY

$43-1=42$	$74-1$	$67-1$	$29-1$
$17-16=1$	$35-34$	$70-69$	$63-62$
$15-2=13$	$27-2$	$41-2$	$91-2$
$15-13=2$	$27-25$	$41-39$	$91-89$
$14-2=12$	$26-2$	$38-2$	$50-2$
$14-12=2$	$26-24$	$38-36$	$50-48$
<i>THE 9. PARTNERS</i>			
$9-2=7$	$9-1$	$9-3$	$9-5$
$9-7=2$	$9-8$	$9-6$	$9-4$
$69-4=65$	$79-6$	$89-5$	$19-3$
$12-9=3$	$14-9$	$17-9$	$13-9$
$12-3$	$14-5$	$17-8$	$13-4$

MATHS & MEMORY

$72-9=63$	$84-9=75$	$53-9$	$66-9$
$39-4=35$	$29-3=26$	$49-2$	$79-5$
$62-31=31$	$24-12$	$36-18$	$48-24$
HALF 52 DO HALF 40 + HALF 12 26	HALF 34	HALF 76	HALF 98
$14-8$	10-PARTNER OF 8 = 2. ADD 4 = 6 EVENTUALLY IN ONE STEP		
$12-7$	$13-5$	$11-6$	$15-7$
$42-7$	$53-6$	62-8	$75-9$
THINK $40-5$	DO $50-3$	DO	DO
35	47		
$100-73$	$200-82$	$300-75$	$400-57$
DO $7+20$	DO $8+10+100$		
27	118		

MATHS & MEMORY

10-1	11-3	12-5	13-7	14-9
11-2	12-3	13-8	14-5	10-2
15-9	10-7	11-5	12-6	10-4
11-8	12-9	13-5	14-7	16-9
10-5	11-6	12-8	13-6	14-8
11-7	10-8	16-8	15-7	13-9
10-3	11-4	12-7	13-4	16-7
11-9	12-4	10-9	15-8	10-6
14-6	15-6	17-8	18-9	17-9
TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5
10-8	13-8	14-9	14-5	12-6
10-PARTNER	10-PARTNER†	9-REMAINDER SUM = DIGITS	THE REVERSE	HALVES

ALGORISMS

● ONLY WHEN YOU'VE SCORED 100% (PAGE 18)

98	POSITIVE	98	77	88
-55	NEGATIVE	55	-43	-35
43	POSITIVE	43		
-7	-3	+9	-15	+8
	25 NEGATIVES		SCORE	
	17 POSITIVES		-8	

TYPE 2: "TAKE, PUT"

● BECOMES 9

72	MENTALLY! NO CRUTCH FIGURES YOU HAVE TO USE YOUR BRAIN, NOT YOUR PEN OTHERWISE THEY BOTH RUN OUT!
-17	
55	DO 12-7 is 5 6-1 is 5

MATHS & MEMORY

43	52	64	76	82
- 8	- 7	- 6	- 8	- 9
35				
54	73	195	376	222
- 15	- 25	- 36	- 27	- 77
39			349	145
333	444	555	666	777
- 166	- 288	- 177	- 399	- 199
300	700	803	506	403
- 176↑	- 246↑	- 555	- 177	- 111
124↑	454↑	248		
CHECK	555 6	36	HERE KEEP THE 9 (NOT 0)	
UP	- 220 - 4	- 22	- 4	
YOU MUST GET 300	335 2 <small>3+3+5=11 2</small> ✓	14 <small>1+4=5</small>	5 ✓	

MATHS & MEMORY

NEW

WAYS TO

REMEMBER

THE

TIMES TABLES

$3 \times 6 = 18$

$2 \times 27 = 54$

THE 9-PARTNERS

$1 \xi 8$

$2 \xi 7$

$3 \xi 6$

$5 \xi 4$

NEXT DOOR

9×2

9×3

9×4

9×5

18

27

36

45

9×6

9×7

9×8

9×9

ONE "RECIPE", EIGHT ANSWERS

5×2

5×4

5×6

5×8

10

20

1 RECIPE, 4 ANSWERS

6×2

6×4

6×6

6×8

12

24

1 RECIPE, 4 ANSWERS

$12 = 3 \times 4$

$7 \times 3 = 21$

$7 \times 6 = 42$

8

$= 7 \times 8$

$8 \times 4 =$

$8 \times 8 =$

$2 \times 3 \times 4$

MATHS & MEMORY

2 WEEKS $2 \times 7 = 14$ FORTNIGHT = 14 NIGHTS	3x3 ●●● ●●●
$4 \times 7 = 28$ FEBRUARY 2ND MONTH, 8 LETTERS	CHANNEL 9

$15 = 3 \times 5$	IF TWO FOURS ARE 8
$35 = 5 \times 7$	FOUR FOURS ARE 2×8
$25 = 5 \times 5$	TWO EIGHTS SIXTEEN DOUBLES ARE ALWAYS EVEN

2×9 18	2×2 4	3×9 27	3×2 6
6×6 36	2×6 12	9×5 45	7×8 56
9×5 45	3×7 21	7×9 63	8×4 32
8×9 72	6×7 42	9×9 81	8×8 64
5×2 10	2×6 12	4×5 20	4×6 24
5×6 30	9×4 36	5×8 40	6×8 48
3×3 9	3×5 15	3×6 18	7×5 35
3×8 24	5×5 25	2×7 14	4×2 8
4×7 28	2×8 16	7×7 49	4×4 16

CONTINUE ONLY WHEN SCORE IS 100% IN 40 SEC.

MATHS & MEMORY

ALGORITHMS

ONLY WHEN YOU KNOW THE TABLES

$$\begin{array}{r|l} 12 & 20 \\ 35 & 8 \\ \hline \times 4 & \times 4 (32) \\ \hline 140 & 5 \checkmark \\ 1+4=5 & \end{array}$$

DEMONSTRATION

DO NOT WRITE

You must **SEE** 20

You must **SEE** ¹² BEFOREHAND!

THEN SAY ALOUD: 20, PUT DOWN THE 0,

CARRY THE 2 'N 12 IS 14

NUMBER FLUENCY

YOU SAY 3 APPLES, SO YOU SAY 3 FOURS.

FOLLOWED BY THE ANSWER!

WHAT'S YOUR NAME? JOHN!

SEE 3 FOURS **SAY** 12

That means:

DO NOT REPEAT A QUESTION!!

MATHS & MEMORY

23	5	24	6	47	2	55	1
x 3	x 3	x 3	3	x 3	x 3	x 2	x 2
69	15 6	72	18 9→0	141	6✓	110	2✓
IGNORE 9	✓	7+2=9 IGNORE	✓	1+4+1			
123456789	45 0	123456789	0				
	x 2	x 2			x 3	x 3	
246913578	0	370370367	0✓				
IGNORE	36→9→		✓		36		
13579		235					
x 46 = 40 + 6		x 123			100 + 20 + 3		
81474		705			3		
543160		4700					
624634		23500					
IGNORE		28905					
1234	1	567					
x 56	x 2	x 32					
7404							
61700							
69104	2✓						

WHEN ONLY THE BEST WILL Δ

I TEACH PRIMARY MATHS

IN

6 LESSONS

In your home: \$40

P & C: 3Rs SEMINARS: \$200 ON MONDAYS

Art: 0428 396 120

MATHS & MEMORY

ΔIVISION CLUES

$$3 \times 6 = 18$$

HALF 36 = 18!

$$18 \div 3 = 6$$

$$18 \div 6 = 3$$

$$9 \times 2 = 18$$

1 LESS & THE PARTNER

$$\underline{18} \div 2 = \underline{9}$$

$$18 \div 9 = 2$$

 1 MORE

$$9 \times 3 = 27$$

$$\underline{27} \div 3 = \underline{9}$$

$$27 \div 9 = 3$$

 1 MORE

$$9 \times 4 = 36$$

$$\underline{36} \div 4 = \underline{9}$$

$$36 \div 9 = 4$$

 1 MORE

$$9 \times 5 = 45$$

$$45 \div 5 = 9$$

$$45 \div 9 = 5$$

MATHS & MEMORY

$$9 \times 6 = 54$$

$$54 \div 6 = 9$$

$$54 \div 9 = 6$$

1 MORE

$$9 \times 7 = 63$$

$$63 \div 7 = 9$$

$$63 \div 9 = 7$$

$$9 \times 8 = 72$$

$$72 \div 8 = 9$$

$$72 \div 9 = 8$$

$$9 \times 9 = 81$$

$$81 \div 9 = 9$$

$$6 \times 4 = 24$$

HALF

$$4 \rightarrow 24 \div 4 = 6$$

$$24 \div 6 = 4$$

6 & EVEN

HALF 4

$$6 \times 8 = 48$$

$$48 \div 8 = 6$$

$$48 \div 6 = 8$$

MATHS & MEMORY

$$6 \times 2 = 12$$

$$12 \div 2 = 6$$

$$12 \div 6 = 2$$

$$6 \times 6 = 36$$

$$36 \div 6 = 6$$

$$5 \times 2 = 10$$

$$10 \div 2 = 5$$

$$10 \div 5 = 2$$

$$5 \times 4 = 20$$

$$20 \div 4 = 5$$

$$20 \div 5 = 4$$

$$5 \times 6 = 30$$

$$30 \div 6 = 5$$

$$30 \div 5 = 6$$

$$5 \times 8 = 40$$

$$40 \div 8 = 5$$

$$40 \div 5 = 8$$

MATHS & MEMORY

12 3 4

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

56 7 8

$$56 \div 7 = 8$$

$$56 \div 8 = 7$$

7 3 21

$$21 \div 3 = 7$$

$$21 \div 7 = 3$$

8 4 32

$$32 \div 4 = 8$$

$$32 \div 8 = 4$$

7 6 42

$$42 \div 6 = 7$$

$$42 \div 7 = 6$$

8 8 64

$$64 \div 8 = 8$$

MATHS & MEMORY

$$15 \div 5 = 3$$

$$15 \div 3 = 5$$

$$25 \div 5 = 5$$

$$35 \div 5 = 7$$

$$35 \div 7 = 5$$

$$24 \div 3 = 8$$

8

234

$$24 \div 8 = 3$$

$$14 \div 7 = 2$$

$$14 \div 2 = 7$$

$$49 \div 7 = 7$$

$$28 \div 7 = 4$$

$$28 \div 4 = 7$$

DOING MATHS IS A VISUAL ACTIVITY

EYES HAVE TO BE TRAINED TO SEE

ONLY THEN WILL YOU REMEMBER

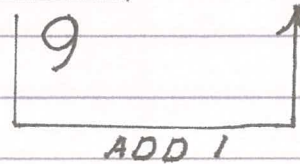
WHAT YOUR EYES HAVE SEEN

EXAMPLES OF HOW SEE ANSWERS

$$\underline{36} \div \underline{9}$$

STEP 2: 1 MORE
STEP 1: 3+6=9
SEE
IS 4

$$\underline{36} \div 4$$



THE 9-PARTNERS

1. $3 \times 6 = 18$

2. HALF 36 IS 18

3. HALF 54 IS 27

1, 8 2, 7

3, 6 5, 4

ALL 36 MULTIPLICATIONS
CAN BE SOLVED
WITH 18 RECIPES

LEAVE IT THIS WAY

$$12345 \div 3 = 4115$$

$$\begin{array}{r} \underline{-12} \\ 3 \\ -3 \\ \underline{4} \\ -3 \\ \underline{15} \\ -15 \\ \underline{0} \end{array}$$

CHECK

$$\begin{array}{r} 4115 \\ \times 3 \\ \hline 12345 \end{array} \checkmark$$

$$12345 \div 2 = 6172 \frac{1}{2}$$

$$\begin{array}{r} \underline{-12} \\ 3 \\ -2 \\ \underline{14} \\ -14 \\ \underline{5} \\ -4 \\ \underline{1} \end{array}$$

MATHS & MEMORY

$18 \div 2$	$4 \div 2$	$18 \div 9$	$27 \div 3$	$6 \div 3$	$36 \div 4$
$12 \div 4$	$45 \div 9$	$56 \div 7$	$54 \div 9$	$21 \div 7$	$63 \div 9$
$32 \div 8$	$72 \div 9$	$42 \div 7$	$81 \div 9$	$64 \div 8$	$10 \div 5$
$12 \div 6$	$20 \div 5$	$24 \div 6$	$30 \div 6$	$40 \div 5$	$36 \div 6$
$48 \div 8$	$9 \div 3$	$15 \div 3$	$18 \div 6$	$35 \div 7$	$24 \div 3$
$25 \div 5$	$14 \div 2$	$16 \div 4$	$27 \div 9$	$16 \div 2$	$36 \div 9$
$6 \div 2$	$12 \div 3$	$45 \div 5$	$56 \div 8$	$54 \div 6$	$21 \div 3$
$63 \div 7$	$32 \div 4$	$72 \div 8$	$42 \div 6$	$10 \div 2$	$12 \div 2$
$20 \div 4$	$24 \div 4$	$30 \div 5$	$48 \div 6$	$15 \div 5$	$18 \div 3$
$35 \div 5$	$24 \div 8$	$14 \div 7$	$8 \div 4$	$28 \div 7$	$8 \div 2$
$28 \div 4$	$40 \div 8$	$49 \div 7$	$16 \div 8$		

MATHS & MEMORY

9	2	2	9	2	9
3	5	8	6	3	7
4	8	6	9	8	2
2	4	4	5	8	6
6	3	5	3	5	8
5	7	4	3	8	4
3	4	9	7	9	7
9	8	9	7	5	6
5	6	6	8	3	6
7	3	2	2	4	4
7	5	7	2		

LONG DIVISION

THE TRACHTENBERG METHOD

HERE: THE 13x TABLE IS WRITTEN OUT BEFOREHAND.
PUT 13 ON A PIECE OF PAPER. ADD IT TO THE EXISTING 13:
TO GIVE 26. MOVE THE 13 AND ADD TO THE 26, ETC, ETC, ETC.

987654321	÷ 13	75973409	$\frac{4}{13}$
<u>91</u>		26 ²	
77		39 ³	
-65		52 ⁴	
<u>126</u>		65 ⁵	
-117		78 ⁶	
<u>95</u>		91 ⁷	
-91		104 ⁸	
<u>44</u>		117 ⁹	
-39		130 ¹⁰	
<u>53</u>			
-52			
<u>121</u>			
-117			
<u>4</u>			

4 LEFT OUT OF 13

CHECK: $10 \times 13 = 130$
REMAINDER 4
IS NOT AN ANSWER!

34

MENTALS

$$98765 \div 2$$

$$49382 \frac{1}{2}$$

$$98765 \div 3$$

$$98765 \div 4$$

$$98765 \div 5$$

$$98765 \div 6$$

$$98765 \div 7$$

$$98765 \div 8$$

ALGEBRA WITH ^{LETTERS} PRO NUMERALS FOR NUMBERS

USING LAWS OF OPPOSITES

$$x + 10 = 15$$

$$x = 5$$

$$y - 2 = 14$$

$$y = 16$$

$$2x - 10 = 2$$

$$x = 6$$

$$4a = 12$$

$$a = 3$$

$$x \div 5 = 4$$

$$x = 20$$

$$\frac{a}{6} = 2$$

$$a = 12$$

$$x + 2 = 10$$

$$x =$$

$$y + 3 = 12$$

$$y =$$

$$x \div 6 = 5$$

$$x$$

$$3x + 3 = 18$$

$$4y - 5 = 15$$

$$2x \div 2 = 13$$

$$4x - 2 = 14$$

$$5y + 2 = 27$$

$$3x \div 2 = 6$$

$$\frac{x}{5} = 3$$

$$\frac{2x}{4} = 3$$

$$\frac{3a}{7} = 3$$

FRACTIONS

SHADED

2 OUT OF 5

WRITE

START $\frac{2}{5}$

SAY

TWO FIFTHS

NOT SHADED

$$\frac{5}{5} + \frac{2}{5} = \frac{3}{5}$$

$\frac{3}{5}$ → THE NUMERATOR
 $\frac{5}{5}$ → THE DENOMINATOR NAME

ONE WHOLE IN MATHS

SPECIAL NAMES

COMPARE: IN ENGLISH

$\frac{1}{2}$ HALF

5 FIFTHS - 2 FIFTHS = 3 FIFTHS

$\frac{1}{4}$ A QUARTER

LIKE

5 APPLES - 2 APPLES = 3 APPLES

$\frac{1}{3}$ A THIRD

$$1 - \frac{3}{7} = \frac{4}{7}$$

$$1 - \frac{5}{8}$$

$$3 - \frac{4}{5} = 2\frac{1}{5}$$

$$3 - \frac{2}{9}$$

$$5 - 2\frac{1}{7} = 2\frac{6}{7}$$

$$4 - 1\frac{2}{11}$$

$$2 + 5\frac{5}{6} = 7\frac{5}{6}$$

$$3 + 3\frac{1}{4}$$

PROPER FRACTION

$$\frac{5}{9}$$

IMPROPER

$$\frac{11}{5}$$

$$\frac{11}{5} = 2\frac{1}{5} \text{ MIXED NUMERAL}$$

$$\frac{13}{7} =$$

$$2\frac{4}{9} = \frac{22}{9}$$

$$3\frac{1}{5} = \text{---}$$

$$3\frac{1}{7} = \frac{22}{7}$$

$$5\frac{3}{4} = \text{---}$$

FRACTIONS

THE PROFESSIONAL WAY

THE 4 BARK RECIPES

$$\frac{4}{7} + \frac{1}{3} =$$

$$\frac{19}{21}$$

$$\frac{4}{7} - \frac{1}{3} =$$

$$\frac{5}{21}$$

$$\frac{4}{7} \times \frac{1}{3} =$$

$$\frac{4}{21}$$

$$\frac{4}{7} \div \frac{1}{3} =$$

THINK $\frac{12}{7}$

WRITE $1\frac{5}{7}$

$$\frac{3}{7} + \frac{1}{2}$$

$$\frac{1}{2} - \frac{3}{7}$$

$$\frac{3}{7} \times \frac{1}{2}$$

$$\frac{3}{7} \div \frac{1}{2}$$

$$1\frac{3}{5} + 3\frac{1}{6} = 4\frac{23}{30}$$

$$2\frac{3}{7} + 5\frac{1}{4}$$

$$1\frac{1}{5} - 1\frac{1}{6} = \frac{6}{5} - \frac{7}{6} = \frac{1}{30}$$

$$1\frac{1}{6} - 1\frac{1}{7}$$

$$3\frac{2}{3} \times 2\frac{1}{5} = \frac{11}{3} \times \frac{11}{5} = \frac{121}{15} = 8\frac{1}{15}$$

$$1\frac{3}{7} \times 1\frac{4}{5} = \frac{10}{7} \times \frac{9}{5} = \frac{90}{35} = \frac{18}{7} = 2\frac{4}{7}$$

$$2\frac{1}{5} \times 2\frac{1}{4} =$$

$$3\frac{2}{3} \div \frac{1}{5} = \frac{11}{3} \div \frac{1}{5} = \frac{55}{3} = 18\frac{1}{3}$$

$$2\frac{1}{4} \div \frac{1}{7}$$

$$\frac{1}{2} \text{ OF } \frac{3}{5} \text{ OF } 40 = \frac{3}{10} \times 40 = 12$$

$$\frac{1}{3} \text{ OF } 15 = 5$$

$$\frac{1}{4} \text{ OF } 12 =$$

$$\frac{2}{3} \text{ OF } 15 = 10$$

$$\frac{3}{4} \text{ OF } 12 =$$

$$\frac{1}{4} \text{ OF } 60 = 15$$

$$\frac{1}{3} \text{ OF } 24$$

WHICH IS $\frac{1}{3}$ OF 45

WHICH IS $\frac{1}{4}$ OF

TRAVELLED $\frac{3}{5}$ OF 450 km

TRAVELLED $\frac{1}{3}$ OF 150 km

$\frac{2}{5}$ OF 450 TO GO = 180 km

$\frac{1}{3}$ YEAR 10 PLAYS TENNIS

$\frac{1}{2}$ TENNIS, $\frac{2}{5}$ SOCCER

$\frac{1}{2}$ PLAYS SOCCER, 18 NO SPORT

NO SPORT 10

$$\text{SPORT } \frac{1}{3} + \frac{1}{2} = \frac{5}{6} \therefore \frac{1}{6} = 18$$

$\therefore 108$ IN YEAR 10

MATHS & MEMORY

CHALLENGE: 1 BAG OF JELLY BEANS.

1. Take $\frac{1}{4}$
2. Take half of what's left.
3. Take $\frac{2}{3}$ of what's left.
4. 7 beans left.
5. How many in the bag?

$$\frac{1}{8} + x = \frac{3}{4}$$

$$x = \frac{3}{4} - \frac{1}{8} = \frac{5}{8}$$

$$\frac{1}{6} + x = \frac{5}{12}$$

$$\frac{2}{7} + x = \frac{5}{14}$$

$$40 \div \left(1 - \frac{3}{7}\right) =$$

$$40 \div \frac{4}{7} =$$

$$40 \times \frac{7}{4} = 70$$

$$30 \div \left(1 - \frac{1}{6}\right) =$$

$$18 \div \left(1 - \frac{1}{3}\right) =$$

$$\frac{2}{7} \text{ (OF) } x = 12$$

$$2x = 84$$

$$x = 42$$

$$\frac{3}{5} x = 15$$

$$\frac{2}{9} x = 4$$

THE
RECIPROCAL OF

$$2\frac{1}{5} \text{ IS } \frac{5}{11}$$

THE
RECIPROCAL OF

$$3\frac{1}{4} \text{ IS}$$

THE
AVERAGE OF
5, 6, 7 & 3 IS $5\frac{1}{4}$

AV. OF 4, 8, 3 & 5 IS...

$$4 \times \frac{1}{7} = \frac{4}{7}$$

$$3 \times \frac{1}{8} =$$

$$5 \times \frac{2}{11}$$

$$6 \times \frac{1}{3} = 2$$

$$5 \times \frac{4}{5} =$$

$$3 \times \frac{1}{3}$$

$$2 \times \frac{3}{16} = \frac{3}{8}$$

$$3 \times \frac{2}{9} =$$

$$4 \times \frac{1}{8}$$

How many halves in 1

2

How many thirds in 1

How many thirds in 2

6

How many fifths in 4

How many 2 fifths in 4

10

How many 2 thirds in 4

$\frac{5}{8}$ of a litre

$$\frac{5}{8} \times 1000 = 625 \text{ ml}$$

$$\frac{3}{4} \text{ of } \frac{7}{9} = \frac{3}{4} \times \frac{16}{9} \quad \begin{array}{l} \text{THINK } \frac{12}{9} \\ \text{WRITE } \frac{1}{3} \end{array}$$

$\frac{2}{5}$ of $\frac{1}{3}$

MATHS & MEMORY

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$$

$$= \frac{5}{6} + \frac{1}{4} = 1 \frac{1}{12}$$

$$\frac{1}{2} + \frac{2}{3} + \frac{3}{4}$$

$$\frac{4}{5} - \frac{1}{2} + \frac{1}{3}$$

$$\frac{1}{2} + \frac{1}{3} \times \frac{1}{4} + \frac{1}{6}$$

$$\frac{1}{12} + \frac{2}{3} =$$

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

$$\frac{1}{2} + \frac{1}{5} \times \frac{1}{2} + \frac{1}{3}$$

$$\frac{1}{2} + \frac{1}{3} \div \frac{1}{4} + \frac{1}{6}$$

WHAT FRACTION

IS

THIS
OF THAT

24 cm of 1 m

$$\frac{24}{100} = \frac{6}{25}$$

4 WEEKS OF 1 YEAR

450 g of 1 kg

FRACTION

TO

DECIMALS

$$5 + \frac{7}{10} + \frac{2}{100} =$$

$$3 + \frac{5}{100} + \frac{3}{10000}$$

FROM DECA=10 (GR.)

DECIMAL POINT

5.72

MATHEMATICAL
SHORTHAND
GREATER ACCURACY

RECURRING DECIMALS

$\dot{.6} = .666\dots$	$\dot{.18} = .1888\dots$	$\ddot{.18} = .1818\dots$
------------------------	--------------------------	---------------------------

RECURRING TO RATIONAL

$10 \times \dot{.6} = 6.\dot{6}$	$100 \times \dot{.18} = 18.\dot{8}$	$100 \times \ddot{.18} = 18.\ddot{18}$
$-1 \times \dot{.6} = \dot{.6}$	$-10 \times \dot{.18} = 1.\dot{8}$	$-1 \times \ddot{.18} = \ddot{.18}$
<hr/>	<hr/>	<hr/>
$9 \times \dot{.6} = 6$	$90 \times \dot{.18} = 17$	$99 \times \ddot{.18} = 18$
$\dot{.6} = \frac{2}{3}$	$\dot{.18} = \frac{17}{90}$	$\ddot{.18} = \frac{2}{11}$

$\dot{.7}$

$\dot{.17}$

$\ddot{.17}$

10×2.34

23.4

$100 \times .123$

12.3

$1000 \times .12$

120

$123 \div 10$

12.3

$456 \div 100$

4.56

$78 \div 1000$

$.078$

ALGORISMS

$$\begin{array}{r} 56.78 \\ + 12.11 \\ \hline 68.89 \end{array}$$

$$34.56 + 88.44$$

$$\begin{array}{r} 12.345 \\ \times .002 \\ \hline 24690 \text{ STEP 1} \\ .02469 \text{ STEP 2} \end{array}$$

$$\begin{array}{r} 12.345 \\ \times .003 \\ \hline \end{array}$$

$$1234.5678 \div .02$$

$$54.321 \div .003$$

REWRITE AS

$$123456.78 \div 2 =$$

$$61728.39$$

ORDER OF OPERATION

1. BRACKETS FIRST: [{ (→

2. THEN \times & \div FROM L TO R

3. POSITIVES & NEGATIVES

$8 + 9 - 13$ 4	$13 + 15 \div 3$ 18	$20 - 3 \times 4$ 8
$10 + 2 - 13$	$6 + 12 \div 4$	$24 - 2 \times 7$
$6 + 10 \times (4 - 2)$ 26	$(81 \times 5) + (19 \times 5)$ 500	$-24 \div -8$ 3
25×4 100	-25×4 -100	-25×-4 100
11×2	-11×2	-11×-2

CALCULATOR

$60 \div 5 - 4 \times 3$

0

$8 + 7 \times 13$

99

$72 \div 6 \div 3$

4

$30 \div 6 - 2 \times 2$

$3 + 5 \times 10$

$81 \div 9 \div 3$

PERCENT

SYMBOL %

PER 100

A / AND 2 NOUGHTS!

CONVERT TO DECIMAL

$5\% =$

.05

12%

.12

$175\% =$

$\frac{175}{100} = 1.75$

6%

13%

234%

6% of 200

12

12% of 7000

840

20% of 60

12

7% of 300

5% of 7000

40% of 70

In GENERAL:

ALGORITHM
OR
CALCULATOR

24% of 85

$.24 \times 85$

18% of 38

25% of 75

WHAT % IS THIS

OF THAT

34 of 1700

2%

54 of 80

$54 \div .8 =$ %

460g of 2kg

is 46g of 200g

23%

32 of 1600

36 of 70

240g of 2kg

THE FAMOUS DOZEN

AS FRACTIONS

FROM DOZEN = 12 (Fr)

PERCENT OF	A NUMBER	FRACTION	ANSWER	QUESTIONS
100	24	1	24	100% OF 28
75	16	$\frac{3}{4}$	12	75% OF 20
$66\frac{2}{3}$	27	$\frac{2}{3}$	18	$66\frac{2}{3}$ % OF 18
50	30	$\frac{1}{2}$	15	50% OF 12
$33\frac{1}{3}$	30	$\frac{1}{3}$	10	$33\frac{1}{3}$ % OF 27
25	24	$\frac{1}{4}$	6	25% OF 16
$12\frac{1}{2}$	96	$\frac{1}{8}$	12	12% OF 24
10	70	$\frac{1}{10}$	7	10% OF 40
5	60	$\frac{1}{20}$	3	5% OF 80
4	75	$\frac{1}{25}$	3	4% OF 100
2	150	$\frac{1}{50}$	3	2% OF 200
1	400	$\frac{1}{100}$	4	1% OF 200
$3\frac{4}{5} = 38\%$	$\frac{11}{20} = 55\%$			$2\frac{1}{4} = \%$

If 20% of a number is 30,
THE NUMBER IS 150

If 25% of a number is 20.
THE NUMBER IS

IN GENERAL BY CALCULATOR

If 14% of x is 98
 x is $98 \div .14 = 700$

If 22% of x is 44
 x is

21% POPULATION IN SYDNEY

79% ELSEWHERE

CAT FOOD: 20% FISH.
75% CEREAL

OTHER INGREDIENTS $x\%$

$7\frac{1}{2}\%$ of 1m = $7\frac{1}{2}$ cm

13% of \$1 = x CENTS

INCREASE 560

BY 20%

$$560 + \frac{1}{5} \text{ of } 560 = 672$$

INCREASE 400

BY 25%

DECREASE 120

BY 10%

108

DECREASE 96

BY $12\frac{1}{2}\%$

COST \$60, SELL \$80

PROFIT $33\frac{1}{3}\%$ ($\frac{1}{3}$)
OF COST

25% ($\frac{1}{4}$) OF SALE

COST \$100, SELL \$150

COST \$2680

PROFIT 22%

SELL FOR 122%

$$2680 \times 1.22 =$$

\$3269.60

COST \$2400

PROFIT 30%

SELL FOR

\$

COST \$400

DISCOUNT 15%

PAY $4 \times 85 = \$340$

COST \$300

DISCOUNT 20%

$$\frac{3}{4} = 3 \div 4 = .75$$

$$\frac{5}{6} = 5 \div .06 = 83.3\%$$

$$.075 = 7.5\%$$

$$\frac{4}{5} =$$

$$\frac{4}{5} =$$

$$.063 =$$

$$2.013 = 2 \frac{13}{1000}$$

$$3\% = \frac{3}{100}$$

$$140\% = 1.4$$

$$5.017 =$$

$$7\% =$$

$$125\% =$$

$$3\frac{1}{2}\% = \frac{7}{200}$$

$$3\frac{1}{3}\% = \frac{10}{300} = \frac{1}{3}$$

$$2\frac{2}{3}\% = \frac{8}{300} = \frac{2}{75}$$

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

$$4\frac{1}{3}\% =$$

$$1\frac{1}{3}\% =$$

RATE: A PLANT GROWS FROM 4 cm TO 11 cm IN 1 WEEK
DAILY GROWTH RATE: 1 cm

POPULATION: FROM 10 700 TO 121 IN 5 YEARS

ANNUAL GROWTH RATE 280

PREMIUM: \$3.50 PER \$100 p.a. \$10000 WORTH COSTS \$350 p.a

CALCULATIONS

\$2.10 FOR 3 Kg

$$2.10 \div 3 \times 5 = \$3.50 \text{ FOR } 5 \text{ kg}$$

\$2.40 FOR 4 Kg

FOR 7 Kg

BRICK LAYING

180 IN 60 MINUTES (1 HOUR)

$$180 \div 60 \times 40 = 120 \text{ IN } 40 \text{ MINUTES}$$

120 IN 1 HOUR

IN 10 MINUTES

$$\frac{3}{5} x \left(\frac{3}{5} \text{ OF A NUMBER} \right) = 9$$

$$3x = 45$$

$$x = 15$$

$$\frac{4}{7} x = 12$$

$$x =$$

CALCULATOR

108 Km on 9L

360 Km on x L

SET IT UP LIKE THIS

ALL PURPOSE RECIPE

$$\leftarrow \begin{array}{r} \cancel{108} \quad \cancel{15} \quad \cancel{9} \\ \cancel{360} \quad \cancel{15} \quad x \end{array} \quad x = 30L$$

SAY

"TIMES, DIVIDE"

CALCULATOR

64 km on 8L

72 Km on x

3% OF A NUMBER IS 12

7% OF A NUMBER IS 21

HERE MENTALLY

$$x = 1200 \div 3 = 400$$

$$\frac{2}{7} x = 6$$

$$x = 21$$

$$\therefore \text{THEREFORE } \frac{1}{3} x = 7$$

$$\frac{2}{9} x = 4$$

$$x =$$

$$\therefore \frac{1}{6} x =$$

RATIO & PROPORTION

CONCRETE MIX

1 : 3 : 4

CEMENT SAND AGGREGATE

FOR 1 m^3 (CUBIC METRE)

$\frac{1}{8}\text{ m}^3$ CEMENT, $\frac{3}{8}\text{ m}^3$ SAND

$\frac{1}{2}\text{ m}^3$ AGGREGATE

DUTCH DINNER

POTATOES, ONIONS, CARROTS

3:1:2

FOR 1 Kg

SIDES TRIANGLE

2:3:4

PERIMETER 81 cm

AROUND MEASURE

PERISCOPE - AROUND SEE

TELESCOPE - FAR SEE

SIDES $\frac{2}{9} \times 81 = 18\text{ cm}$

$\frac{1}{3} \times 81 = 27\text{ cm}$

$\frac{4}{9} \times 81 = 36\text{ cm}$

CHECK 81 cm ✓

ANGLES TRIANGLE

2:3:4

ANGLE SUM 180°

TREE 6m, SHADOW 2m

BUILDING: Height h m
SHADOW 7 m

SET IT UP

$$\frac{6}{h} = \frac{2}{7}$$

TIMES
DIVIDE

$$h = 21\text{m}$$

POLE 4m
SHADOW 1m

BUILDING h m
SHADOW 3 m

5, 8, x , 32

ARE IN PROPORTION

$$\therefore 8x = 160$$
$$x = 20$$

3, 7, x , 21

ARE IN PROPORTION

DIVIDE 56 RATIO 3:5

$$1 \text{ PART} = \frac{3}{8} \times 56 = 21$$

$$\text{OTHER} = \frac{5}{8} \times 56 = 35$$

CHECK $21 + 35 = 56$

DIVIDE 81

RATIO 2:7

SCALE

IF 1 CM REPRESENTS 1m, SCALE IS 1:100

IF 1mm REPRESENTS 2m, SCALE IS

DIAMETER MOON IS 3500 Km

SCALE 1:100 000 000 ∴ 1cm REPRESENTS 1000 Km

MEANS: A CIRCLE $\Delta = 3.5$ cm REPRESENTS THE MOON

DIAMETER EARTH = 12 800 Km

MEANS: A CIRCLE $\Delta =$ cm REPRESENTS THE EARTH

80 km IN 60 MINUTES
8 km IN 6
32 km IN 24

90 Km IN 70 MIN.
27 km IN

$$\frac{3}{5} = \frac{16}{x} \quad \begin{array}{l} \text{TIMES} \\ \text{DIVIDE} \end{array}$$

CALCULATOR: $x = 26.6$

$$\frac{21}{46} = \frac{x}{111}$$

376 Km ON 29 L
 $376 \div 29 \times 20 = 259.3$
ON 20 L

56 ON 4
ON 10

$1 \text{ Km} = 1000 \text{ m}$

$1 \text{ Kg} = 1000 \text{ g}$

$1 \text{ Kl} = 1000 \text{ l}$

$1 \text{ m} = 100 \text{ cm}$

$1 \text{ cm} = 10 \text{ mm}$

$1 \text{ g} = 1000 \text{ mg}$

$1 \text{ L} = 1000 \text{ ml}$

$1 \text{ HECTARE} = 100 \text{ m} \times 100 \text{ m} = 10\,000 \text{ m}^2$

BY

5 ACRES \doteq 2.4 ha

$2\frac{1}{2}$ HECTARES

=

PER

 $20 \text{ m/SEC} = 0.02 \times 3600 = 2 \times 36 = 72 \text{ Km/HOUR}$

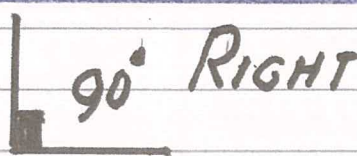
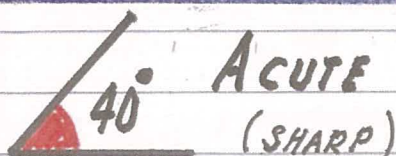
25 m/SEC

=

ANGLES (NOT ANGELS)

MEASURED WITH A PROTRACTOR IN DEGREES

TO TRACE



180°
STRAIGHT

REFLEX

REVOLUTION
CIRCLE 360°

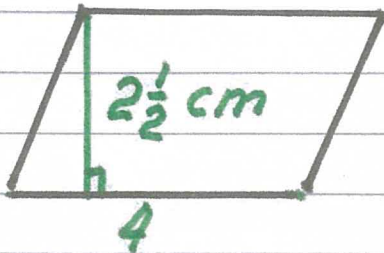
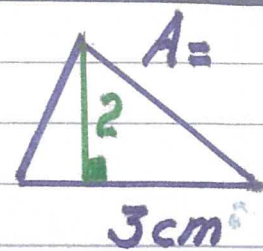
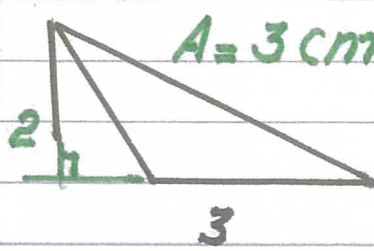
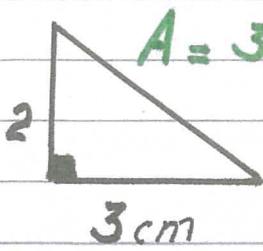
COMPLEMENT OF 40° IS 50°

SUPPLEMENT OF 40° IS 140°

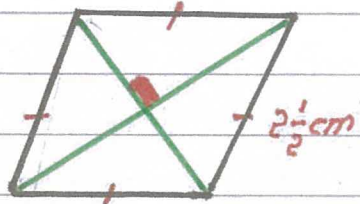
COMPLEMENT OF 50° IS

SUPPLEMENT OF 120° IS

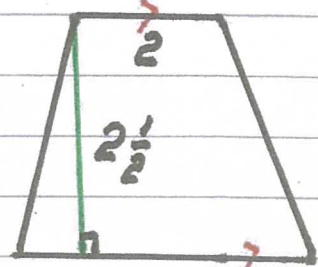
AREA



PARALLOGRAM
 $A = 10 \text{ cm}^2$



DIAGONALS 3 & 4
RHOMBUS
 $A = 6 \text{ cm}^2$

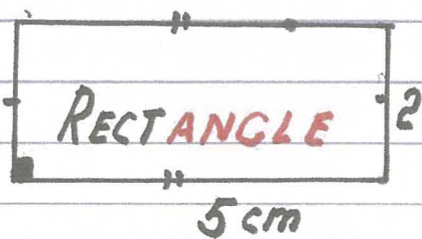


TRAPEZIUM
 $A = 7\frac{1}{2} \text{ cm}^2$

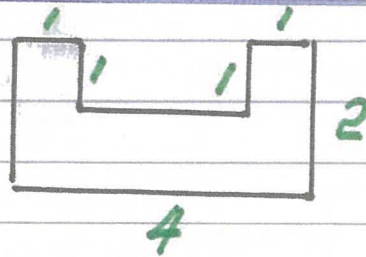
BASE 6, H 4 cm

DIAGONALS 4 & 5 cm

PAR. SIDES 3 & 7
HEIGHT 3 cm



$A = 10 \text{ cm}^2$

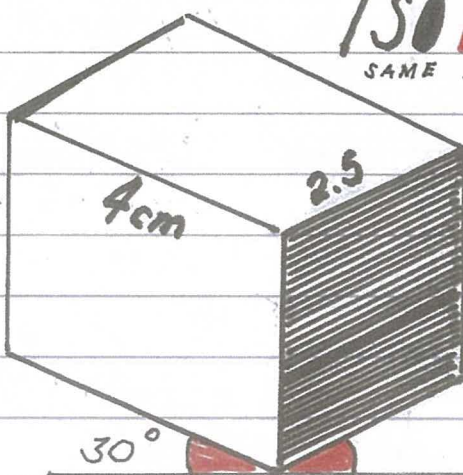


$A =$

TRIANGLE

$B = 10 \text{ cm}, H = 4 \text{ cm}$

$A =$



ISOMETRIC DRAWING
SAME MEASUREMENT (EXACT)

RECTANGULAR
PRISM

VOLUME 30 cm^3

SURFACE AREA: $(2 \times 10) + (2 \times 12) + (2 \times 75) = 59 \text{ cm}^2$

RECTANGULAR

PRISM

$4 \times 5 \times 6 \text{ cm}$

SA =

V =

ANSWERS → A QUICK REVISION

36	$x+2=10$ $x=8$	$4+3=12$ $4=9$	$x \div 6=5$ $x=30$
	$3x+3=18$ $x=5$	$4y-5=15$ $y=5$	$2x \div 2=13$ $x=13$
	$4x-2=14$ $x=4$	$5y+2=27$ $y=5$	$3x \div 2=6$ $x=4$
	$x/5=3$ $x=15$	$\frac{2x}{4}=3$ $x=6$	$\frac{3a}{7}=3$ $a=7$
38	$1-\frac{5}{8}=\frac{3}{8}$	$3-\frac{2}{9}=2\frac{7}{9}$	$4-1\frac{2}{11}=2\frac{9}{11}$
	$3+3\frac{1}{4}=6\frac{1}{4}$	$\frac{13}{7}=1\frac{6}{7}$	$3\frac{1}{5}=\frac{16}{5}$
	$5\frac{3}{4}=\frac{23}{4}$	40 $\frac{3}{7}+\frac{1}{2}=\frac{13}{14}$	$\frac{1}{2}-\frac{3}{7}=\frac{1}{14}$
	$\frac{3}{7} \times \frac{1}{2}=\frac{3}{14}$	$\frac{3}{7} \div \frac{1}{2}=\frac{6}{7}$	$2\frac{3}{7}+5\frac{1}{4}=7\frac{19}{28}$
	$2\frac{1}{5} \times 2\frac{1}{4}=\frac{11}{5} \times \frac{9}{4}=\frac{99}{20}=4\frac{19}{20}$		
	$2\frac{1}{4} \div \frac{1}{7}=\frac{9}{4} \div \frac{1}{7}=\frac{63}{4}=15\frac{3}{4}$		

41

ANSWERS → A QUICK REVISION

$$\frac{1}{4} \text{ OF } 12 = 3$$

$$\frac{3}{4} \text{ OF } 12 = 9$$

$$\frac{1}{3} \text{ OF } 24 = 8$$

WHICH IS $\frac{1}{4}$ OF 32

STILL TO GO

$$\frac{2}{3} \text{ OF } 150 = 100 \text{ km}$$

$$\text{SPORT } \frac{1}{2}x + \frac{2}{5}x = \frac{9}{10}x$$

$$\therefore \frac{1}{10}x = 10 \therefore 100 = x$$

THE

BAG OF JELLY BEANS

1. TAKE $\frac{1}{4}x$, $\frac{3x}{4}$ LEFT. 2. TAKE $\frac{1}{2}$ OF $\frac{3}{4}x = \frac{3}{8}x$

2. LEFT $\frac{3}{4}x - \frac{3}{8}x = \frac{3}{8}x$

3. TAKE $\frac{2}{3}$ OF $\frac{3}{8}x = \frac{1}{4}x$ LEFT $\frac{3}{8} - \frac{2}{8} = \frac{1}{8}x = 7 \therefore x = 56$

42. $\frac{1}{6} + x = \frac{5}{12}$

$$x = \frac{5}{12} - \frac{2}{12} = \frac{1}{4}$$

$$\frac{2}{7} + x = \frac{5}{14}$$

$$x = \frac{5}{14} - \frac{4}{14} = \frac{1}{14}$$

$$30 \div \left(1 - \frac{1}{6}\right) =$$

$$30 \div \frac{5}{6} = 30 \times \frac{6}{5} = 36$$

$$\frac{3}{5}x = 15$$

$$x = 25$$

$$\frac{2}{9}x = 4$$

$$x = 18$$

RECIPROCAL OF $3\frac{1}{4}$ IS $\frac{4}{13}$

AVERAGE OF

4, 8, 3, 5 IS 5

43. $3 \times \frac{1}{8} = \frac{3}{8}$

$$5 \times \frac{2}{11} = \frac{10}{11}$$

$$5 \times \frac{4}{5} = 4$$

$$3 \times \frac{1}{3} = 1$$

$$3 \times \frac{2}{9} = \frac{2}{3}$$

$$4 \times \frac{1}{8} = \frac{1}{2}$$

HOW MANY THIRDS
IN 4

12

HOW MANY
TWO THIRDS IN 4

6

$$\frac{2}{5} \times \frac{4}{3} = \frac{8}{15}$$

$$44 \quad \frac{1}{2} + \frac{2}{3} + \frac{3}{4} = \frac{7}{6} + \frac{3}{4} = \frac{46}{24} = \frac{23}{12} = 1 \frac{11}{12}$$

$$\frac{4}{5} - \frac{1}{2} + \frac{1}{3} = \frac{3}{10} + \frac{1}{3} = \frac{19}{30}$$

$$\frac{1}{2} + \left(\frac{1}{5} \times \frac{1}{2}\right) + \frac{1}{3} = \frac{1}{2} + \frac{1}{10} + \frac{1}{3} = \frac{3}{5} + \frac{1}{3} = \frac{14}{15}$$

WHAT FRACTION IS 4 WEEKS OF YEAR: $\frac{4}{52} = \frac{1}{13}$

WHAT FRACTION IS 450g OF/kg: $\frac{45}{100} = \frac{9}{20}$

$$3 + \frac{5}{100} + \frac{3}{1000} = 3.0503$$

$$45 \quad \begin{array}{r} 10 \times .\dot{7} = 7.\dot{7} \\ 1 \times .\dot{7} = .\dot{7} \\ \hline 9 \times .\dot{7} = 7 \\ \dot{7} = \frac{7}{9} \end{array}$$

$$\begin{array}{r} 100 \times .\dot{17} = 17.\dot{7} \\ 10 \times .\dot{17} = 1.\dot{7} \\ \hline 90 \times .\dot{17} = 16 \\ \dot{17} = \frac{8}{45} \end{array}$$

$$\begin{array}{r} 100 \times .\dot{17} = 17.\dot{17} \\ 1 \times .\dot{17} = .\dot{17} \\ \hline 99 \times .\dot{17} = 17 \\ \dot{17} = \frac{17}{99} \end{array}$$

$$46 \quad \begin{array}{r} 34.56 \\ + 88.44 \\ \hline 123.00 \end{array}$$

$$\begin{array}{r} 12.345 \\ \times 3 \\ \hline 37.035 \end{array}$$

$$54321 \div 3 = 18107$$

$$47 \quad 10 + 2 - 13 = -1$$

$$6 + 12 \div 4 = 9$$

$$24 - 2 \times 7 = 10$$

$$11 \times 2 = 22$$

$$-11 \times 2 = -22$$

$$-11 \times -2 = 22$$

48

$30 \div 6 - 2 \times 2 = 1$

$3 + 5 \times 10 = 53$

$81 \div 9 \div 3 = 3$

$6\% = .06$

$13\% = .13$

$234\% = 2.34$

49

$7\% \text{ of } 300 = 21$

$5\% \text{ of } 7000 = 350$

$40\% \text{ of } 70 = 28$

$18\% \text{ of } 38 = .18 \times 38$

$25\% \text{ of } 75 = .25 \times 75$
CALCULATOR

WHAT % IS $\frac{\text{THIS}}{\text{OF THAT}}$

WHAT % IS 32 OF 1600

$\frac{32}{16} = 2\%$

WHAT % IS 36 OF 70

$36 \div 7 = \dots\%$

WHAT % IS 240g OF 2kg
 $240 \div 20 = 12\%$

50

$2\frac{1}{4} = 225\%$

51

IF $20\% \text{ of } X = 20$
 $X = 100$

IF $25\% X = 20$
 $X = 80$

IF $22\% \text{ of } X = 4400$, $X = 4400 \div .22 = 440000 \div 22 = 20000$

20% FISH, 75% CEREAL, OTHER INGREDIENTS 5%

$13\% \text{ of } 1\$ \text{ is } 13¢$

$7\frac{1}{2}\% \text{ of } 1m = 7.5cm$

52

$400 + \frac{1}{4} \text{ of } 400 = 500$

$96 - \frac{1}{8} \text{ of } 96 = 84$

COST \$100, SELL FOR \$150
PROFIT: 50% OF COST
 $33\frac{1}{3}\%$ OF SALEPROFIT: 30% OF 2400
 $= 30 \times 24 = 720$
SALES PRICE \$3120

53. SELL FOR
 $300 + 60 = \$360$

$$1.017 = 5 \frac{17}{1000}$$

$$7\% = \frac{7}{100}$$

$$125\% = 1.25$$

$$4\frac{1}{2}\% = \frac{9}{200}$$

$$4\frac{1}{3}\% = \frac{13}{300}$$

54. $\$2.40$ FOR 4
 $2.40 \div 4 \times 7$
 $= \$4.20$ FOR 7

$$120 \div 60 \times 10 = 20 \text{ IN } 10 \text{ MIN.}$$

$$\frac{4}{7}x = 12$$

$$x = 21$$

55.

$$\frac{64}{72} \frac{15}{15} \frac{8}{x}$$

SIMPLIFIED $\frac{8}{9} = \frac{8}{x}$

WRITE AS:

$$\frac{7}{100}x = 21$$

$$x = 300$$

$$\frac{2}{9}x = 4$$

$$x = 18$$

$$\frac{1}{6}x = 3$$

A VISUAL: $x = 9$

56. MIX 3:1:2
 POTATOES $\frac{1}{2}$ Kg
 ONIONS $\frac{1}{6}$ Kg
 CARROTS $\frac{1}{3}$ Kg

$$\hat{A} = \frac{2}{9} \times 180 = 40$$

$$\hat{B} = \frac{1}{3} \times 180 = 60$$

$$\hat{C} = \frac{4}{9} \times 180 = 80$$

CHECK $\frac{40}{60}{80} = 180 \checkmark$

57. $\frac{4}{h} = \frac{1}{3}$

OR HERE: CROSS multiply

$$h = 12m$$

$$7x = 63$$

$$x = 9$$

1 PART $\frac{2}{9} \times 81 = 18$

58. SCALE 1:2000

9 IN 7

1 PART $\frac{7}{9} \times 81 = 63$

CHECK $\frac{18}{63} = \frac{2}{9}$

$$\Delta \text{ EARTH} = 12.8 \text{ cm}$$

27 IN 21

MENTAL SHORTCUT

$$2\frac{1}{2} \times 56 \text{ ON } 10 = 140 \text{ km}$$

IN GENERAL:
 $56 \div 4 \times 10$
 UNITARY METHOD

59

$$\begin{aligned}
 &0.025 \times 3600 \\
 &= 25 \times 3.6 \\
 &= 90 \text{ Km/hour}
 \end{aligned}$$

COMPLEMENT
 OF 50° IS 40°

SUPPLEMENT
 OF 120° IS 60°

MATHS

&

MEMORY

60

AREA IS
 ALSO 3 cm^2

PARALLELOGRAM

$$\begin{aligned}
 H &= 4 \text{ cm} \\
 B &= 6 \text{ cm} \quad A = 24 \text{ cm}^2
 \end{aligned}$$

RHOMBUS

DIAGONALS 4 & 5
 $A = 10 \text{ cm}^2$

TRAPEZIUM
 PARALLELS 3 & 7 cm
 $H = 3 \text{ cm} \quad A = 15 \text{ cm}^2$

RIGHT
 RECT ANGLES
 $A = B$
 $(4 \times 2) - (2 \times 1) = 6 \text{ cm}^2$

TRIANGLE
 $B = 10, H = 4 \text{ cm}$
 $A = 20 \text{ cm}^2$

RECTANGULAR PRISM: $4 \times 5 \times 6 \text{ cm}$ VOLUME 120 cm^3
 SURFACE AREA: $(2 \times 20) + (2 \times 30) + (2 \times 24) = 148 \text{ cm}^2$
 DRAW THE PRISM 3Δ ISOMETRIC

THE ULTIMATE REVISION

OF PRIMARY MATHS IN 6 PAGES!

MADE POSSIBLE BY COMBINING QUESTIONS & ANSWERS,
 A UNIQUE INVENTION.

SINCE THE BARK DISCOVERY METHOD
 DEPENDS ON SEEING INSTEAD OF UNDERSTANDING,

THE STUDENT MUST BE FLUENT
 IN
 NUMERACY!



Author's Background

Born 20.12.1928

- | | | |
|------------|---|-----------------------------|
| 1. | <u>H.S.C. (HOLLAND)</u>
4 Unit Maths, Mechanics, Technical Drawing
Physics, Chemistry, Biology, Political Economy
History, Geography, Dutch, English. French
German, Art, P.E. | 1947 |
| 2. | Certificate of Ability, Nautical College | Holland, 1949 |
| 3. | Diploma 3rd. Mate, Sea Going Trade | Holland 1951 |
| 4. | Diploma 2nd. Mate, Sea Going Trade | Holland 1954 |
| 5. | Spanish Commercial Correspondence | Holland 1954 |
| 6. | French Commercial Correspondence | Holland 1958 |
| 7. | English Commercial Correspondence | Holland 1961 |
| 8. | Language Studies: Friesian, Italian, B.A. French | |
| 9. | High School Teacher: English & French | Holland 2 yrs |
| 10. | High School Teacher | Australia 14 yrs |
| | <u>De La Salle, Ashfield</u>
Latin, French & English. | |
| | <u>St. Dominic's, Kingswood</u>
Creative Writing, English, Subject Master Technical Drawing | |
| | <u>Patrician Brothers, Granville</u>
Creative Writing, Mathematics, Subject Master Music | |
| | <u>Oakhill College, Castle Hill</u>
Creative Writing, Mathematics, Subject Master Technical
Drawing, French & Art | |
| 11. | Insurance & Real Estate Agent (Finance) | |
| 12. | Owner Builder (Rammed Earth) | |
| 13. | Hawkesbury Adult Education | Creative Writing, Spanish. |
| 14. | Professional Musician | Accordion, Flamenco Guitar. |
| 15. | Author of Textbooks | English & Mathematics |
| 16. | Private Tutor since 1976: | K-12 |
| 17. | Soccer Coach | |

THE 3RS

THE PROFESSIONAL WAY

A. BARK, CATTAL. N.S.W. 2756