Answers **Red**

Maths Challenge Cards

1. Every emu gives 3 sheep
⇒ 1:3 ratio giving 14 legs
266 legs ÷ 14 legs= 19
⇒ 19 emus: 57 sheep

2a.
$$\begin{array}{r} 2\ 7\ 4 \\ 1\ 3\ 9 \\ +\ 5\ 8\ 6 \\ \hline 9\ 9\ 9 \end{array}$$

b.
$$\begin{array}{r} 6\ 4\ 8 \\ -\ 2\ 7\ 9 \\ \hline 3\ 6\ 9 \end{array}$$

3. Ratio is 3:5
in the 16 min swim
⇒ 6:10 min ratio
Downstream
6 min x 50m = 300 m
Upstream
10 min x 30m = 300m
Altogether 600m

4. 1 + 2 + 3…+ 21 = 231
⇒ 21 years old

5. 4 x $27.50 = $110
$110 ÷ 5 = $22 per meal

6. Running days
Nov = 16 & Dec = 31 [1997]
Year = 365 [1998]
Jan = 284 [1999]

Total 440 days
⇒ 440 x 16 = 7040 hours

7. Doubling pattern based
512 1024 2048

8. Combined printing pages
1 + 2, 19 + 20
3 + 4, 17 + 18
Ans. 5 + 6, 15 + 16

9. 4 points x 6 games x 2 sets
x 4 matches =
192 points altogether

10. Triangle operations
4+6+8 = 18 → 1+8 = 9
6+7+2 = 15 → 1+5 = 6
11+7+3 = 21 → 2+1 = 3

11. 1st child 26 x $30 = $780
2nd child 12 x $20 = $240
3rd child 2 x $10 = $ 20
Total 40 players at $1040

12.

X	X	X	
	X	X	X
X	X		X
X		X	X

Other solutions possible

13. Process of elimination
Mystery factor is 37

14. In 1 minute she climbs
10m – 2m slip = 8m
3794m ÷ 8m = 474.25min
474 min = 7 hours 54 minutes

The 0.25 is obsolete,
because Persephone reaches
the top with the last minute,
before she slips back 2 metres.

15. Ratio is 12 : 8 : 3
[using whole numbers]
$460 ÷ 23 = $20 per unit
Eldest = 12 x $20 = $240
Middle = 8 x $20 = $160
Youngest = 3 x $20 = $60

16. Work in reverse
3 x 3 x 2 x 5 x 4 = 360

17a. Bootless
⅓ of 18 = 6
Wrong jumper
½ of 18 = 9
Properly dressed
18 – 6 – 9 = 3 boys

b. Dressed 3 x 3g = 9 goals
Wrong top 9 x 1g = 9 goals
Bootless 6 x 1p = 1 goal
Final score
19 goals = 114 points

18. In Singapore
4,608,595 ÷ 620 = 7,433
people per km²
Australian potential
7,682,300 x 7,433 =
57,102,535,900 people
New Zealand potential
268,680 x 7433 =
1,997,098,440 people

19. Process of elimination
The mystery number is 87,410

20. 46 ÷ 2 = 23
Sylvester 23 + 5 = 28
Claude 23 – 5 = 18

21. "Guess & revise" or algebra
Tony has x games as King
x + 2x + 2x + (2x – 4) = 38
⇒ 7x – 4 = 38
⇒ 7x = 42, so x = 6 games
Answer
Tony 6 & Pete 8
Sonya & Maria 12 each

22. "Guess & revise" or algebra
x = wedding balloons
x + 2x + (x –12) = 100
⇒ 4x – 12 = 100
⇒ 4x = 112, so x = 28
28 wedding balloons
56 birthday balloons
16 New Year's balloons

23. Rule is
top number x 7 then – 2
Work in reverse
(54 + 2) ÷ 7 = 8
Use rule
(9 x 7) – 2 = 61
Work in reverse
(47 + 2) ÷ 7 = 7

24. Total distance
540km x 2 = 1080km
Total time
3 hr + 5 hr = 8 hours
Speed
1080km ÷ 8 hours =
135km/h average speed

25. Tom 365 ÷ 8 = 46 boxes
Hilary 182 ÷ 8 = 23 boxes
Claire 12 boxes
Rebecca 26 ÷ 8 = 4 boxes
John 1 box
Total 86 boxes

26. 54 – 30 – 15 = 9 (S)
30 – 15 – 9 = 6 (R)
$\Rightarrow$ R=6 & S=9

27. Square
75m x 75m = 5625m²
Rectangular
100 x 50 = 5000m²
Circular [the 'best' in size]
Radius = Circum ÷ 2Π
300 ÷ 2 ÷ Π = 47.75m
Area = Π x $(47.75)^2$ = 7163 m²

28. You start 50 steps (st) ahead
50 + (10 x 10st) = 150 st
Friend runs 10 x 15st =
150 st
Answer You cover 100 steps

29. ½ – ⅓ = 1/6
1/6 = 165 pages
$\Rightarrow$ 165 x 6 = 990 pages
⅓ takes 11 hours
$\Rightarrow$ 3 x 11 = 33 hours total

30a. 1+1+1-1-1-1=0
b. 1x1+1+1-1-1=1
[other solutions are possible]

31. 60cm ÷ 10cm $\Rightarrow$ 6 tiles
228cm ÷ 12cm $\Rightarrow$ 19 tiles
Total is 6 x 19 = 114 tiles

32. Single triangles 16
Size "4" triangles 6
Size "9" triangles 3
Size "16" triangle 1
Total triangles 26

33. "Guess & revise" or algebra
Lucia has 'x' cd's
x + (x + 50) + 100 = 3x
$\Rightarrow$ 2x + 150 = 3x
$\Rightarrow$ x = 150
Lucia 150 cd's
Anja 450 cd's
Sophia 200 cd's

34. Possible combinations
3 courses = 3 x 3 x 2 =18
2 courses = (3x5) + (3x2) = 21
Total = 39 combinations

35. "Guess & revise"
Max is 58 years old
Father is 87 years old

36. Create a list
[30 chairs $\rightarrow$ 102 legs]

Broken	Repaired	Total legs
1	29	119
2	28	115
3	27	111
18	12	102

Answer
18 x 3 legs = 54 legs
12 x 4 legs = 48 legs

54 + 48 = 102 legs in total
18 / 30 = 60% broken

37.

	3	10	
11	4	6	5
8	7	9	2
	12	1	

38. 3 + 6 + 9 + 12 + 15 …+ 54 =
513 words in 18 days

39. Arithmetic reasoning

& = 13

@ = 7

= 1

&@# = 21

25 = &#&

41 = &&&##

40. A quarter of 40 = 10
A fifth of 40 = 8

41. 4 x 6 ÷ 2 = 12
12 x 3 ÷ 0.5 = 72
8 x 2 ÷ 0.2 = 80

42. Time lapses are 4, 12 and 7.
All factors of 84.
Therefore 84 hours later is the first possible combined intake
Midday Sunday + 84 hours
⇒ Midnight Wednesday

43. "Guess & revise" or algebra
Balfe ate 'x' ants
x + (x+240) + (x–140) = 940
⇒ 3x – 100 = 940
⇒ 3x = 840
⇒ x = 280
Balfe 280 ants
Potts 520 ants
Mini 140 ants

44a. 11 x 12 x 13 = 1716

b. 93 + 95 + 97 + 99
= 384

45. Process of elimination
Mystery number is 239

46. 'New' (no doubling) handshakes
3 + 2 + 1 + 0 = 6
'New' female kisses
3 + 2 + 1 + 0 = 6
'New' mixed gender kisses
4 + 4 + 4 + 4 = 16
Total kisses = 22

47a. Old showers – old time
140L x 365 = 51,100L
Old showers – new time
140L ÷ 7 min = 20L/min
80L x 365 = 29,200L
Savings
51100 – 29200 = 21900L

b. New showers
60% x 80L = 48L
48L x 365 = 17520L

48. 13 years x 21 students =
273 students in total.

49. "Guess & revise" or algebra
y = smaller number
y x 2y = 722
$2y^2 = 722$
$y^2 = 361$, so y = 19
Answer
19 x 38 = 722

50. 4⅓ bags = 65 gold coins
65 ÷ 4⅓ = 15 gold coins
⇒ 1 bag = 15 gold coins

51. Create / use a calendar
a. Friday 31st October
b. Wednesday 22nd October

52. Arithmetic reasoning
$\Psi = 2$
$\prod = 3$
$\varnothing = 4$

53. ½ x ⅔= 2/6
⇒ ⅓ = legs
Legs ÷ 4 = 10cm
⇒ ⅓ ÷ 4 = 1/12
⇒ 1/12 = 10cm
⇒ 12 x 10 = 120cm in total

54. Previous year
40 girls & 80 boys
Recruitment
168 – 120 = 48 players
Girl / boy ratio is 3:1
⇒ 36 girls & 12 boys
New season
76 girls & 92 boys

55a. 3 + 29 + 31 + 37 = 100
b. 7 x 11 x 13 = 1001

56.

Solution 1		Solution 2
50¢	x1 = 50¢	x 1 = 50¢
20¢	x4 = 80¢	x 2 = 40¢
10¢	x4 = 40¢	x10 = 100¢
5¢	x6 = 30¢	x 2 = 10¢

57. "Guess & revise" or algebra
x = child ticket
2x + (2x + 10) = 40
⇒ 4x = 30, so x = 7.5
Child ticket $7.50
Adult ticket $12.50

58. A third of 60 = 20
A fifth of 60 = 12
Answer ⇒ 60

59. Total number of students = x
x(1 – (2/5 + 1/10 + 3/8)) = 25
⇒ x (1 – 35/40) = 25
⇒ x/8 = 25
⇒ x = 200

60. Jan = 60kg
Feb = 60 x 1.4 = 84kg
Mar = 84 x 1.5 = 126kg
Apr = 126 + (126 ÷ 6) = 147kg
Overall increase ⇒
(147 ÷ 60) x 100 = 245%

61. 160 ÷ 5 = 32 [median]
Gary's scores
42, 37, 32, 27, 22

62. 260km x 1000m x 100cm =
26×10^6 cm
$26 \times 10^6 \div 72{,}375$ racquets
⇒ 359 cm per racquet

63. Make a costs table
Answer
200 cans x 8¢ = $16
100 bottles x 5¢ = $5

64. "Guess & revise"
a. 17 + 37 + 47 = 101
or 11 + 43 + 47 = 101

b. 17 x 19 x 23 x 29 =
215, 441

65. Create a list
[30 questions → 100 points]

Correct	Incorrect	Score
30	0	210
29	1	200
28	2	190

Answer
19 correct = 19x7 = 133 points
11 incorrect = 11x3 = 33 points
Total = 133 – 33 = 100 points
in 30 responses

66. "Guess & revise"
Martin 48 years
Janice 36 years
Camilla 12 years
Andrew 9 years

67. 125 ÷ 5 = 25 [median]
Drank 25 cans in 3rd hour
Above median
25 + 7 = 32 32 + 7 = 39
Below median
25 – 7 = 18 18 – 7 = 11
Hourly consumption of cans
39, 32, 25, 18, 11

68. Running speed
18km/h ÷ 60 = 300m per min
300 ÷ 60 = 5m per sec
1st meet half way around
200m ÷ 5m/s = 40 sec
Therefore
2nd time 400m → 80 sec
3rd time 600m →120 sec [2 min]

69. Arithmetic reasoning
21 x 6 = 126

70. x = number of apples
x + (x + 5) + (x – 1) = 25
⇒ 3x + 4 = 25
⇒ x = 7 apples

y = cost of a tomato
2(7y) + 6y = $6
[apples are twice the cost]
⇒ 20y = $6, so y = 30¢

Oranges 12 x 50¢ = $6.00
Apples 7 x 60¢ = $4.20
Tomatoes 6 X 30¢ = $1.80

71. Pattern
13, 15, 19, 20
23, 25, 29, 30, 33
35, 39, 40, 43, 45
- 45 minutes on 14th day
- Total minutes = 409
409 ÷ 14 = 29 min 13 sec.

72. "Guess & revise"
5 years ago
Igor 5 and Murray 35
Igor is 10 years old now
Murray is 40 years old now

73. Mark
Chris
Sally
Cathleen
Douglas
Mace
Penny

74. Create a costs list
Answer

4 x $15 caps	$60
5 x $8 broad	$40
2 x $10 design	$20

75. Mean = 7
Therefore
1,2,3,4,5,6,7,8,9,10,11,12,13
Dario is turning 13
Blown out 13 x 7 = 91 candles

76a. Arithmetic reasoning
K = 5
L = 1
M = 0
$\Rightarrow$ 101 x 5 = 505

b. $101^2 = 10201$

77. b = blueberry
b + 3b + (b + 10) = 90
$\Rightarrow$ 5b + 10 = 90
$\Rightarrow$ b = 16

Vanilla = 48
Chocolate = 26
Blueberry = 16

78. 8465.4 x 5 = 42,327m
42,327 – 7879 – 8475 – 8501 – 8598 = 8874m
Everest $\Rightarrow$ 8874m

79. 3 x 6 x 2 ÷ 9 = 4
1 x 10 x 7 ÷ 2 = 35
4 x 5 x 3 ÷ 12 = 5

80. Work in reverse
20¢ x 3 x 4 x 2 x 8
= $38.40

E81. Set-up a 'costs' table
[14 cakes $\rightarrow$ $160]
More than one solution

Round	Square	Pyramid	Cost
1	5	9	$184

Answers include

4	3	7	$160
4	10	2	$160

E82. Ratio of speed
up : down → 30 : 70
[3 x 7 = 7 x 3]
Upstream
30m/h x 70 hrs = 2100m
Downstream
70m/h x 30 hrs = 2100m
Total
4.2km in 100 hours

E83. 10 showbag combinations
[0c, 6d, 2l] [0c, 3d, 6l]
[0c, 0d, 10l] [1c, 1d, 7l]
[1c, 4d, 3l] [2c, 2d, 4l]
[2c, 5d, 0l] [3c, 3d, 1l]
[3c, 0d, 5l] [4c, 1d, 2l]

E84. Set-up a 'legs' table

Birds	Cats	Dogs	Legs
15	1	2	42
12	2	4	48
9	3	6	54
6	4	8	60

Answer
6 birds [12 legs]
4 cats [16 legs]
8 dogs [32 legs]

E85. 558 points ÷ 4 = 139.5 median
Difference is 39 ÷ 3 = 13
Therefore 13 ÷ 2 = 6.5

Answer
Gianni 139.5 + 6.5 = 146
Gaston 146 + 13 = 159 points
Ivan 139.5 – 6.5 = 133 points
Stanislow 133 – 13 120 pts

E86. Combined work rate is

$$\frac{15 \times 20}{15 + 20} = 8.571 \text{ hours}$$

⇒ 8.5714 x 60 = 8 hr 34 min & 17 seconds
⇒ 8:34.17 x 2 [for 120m²]
= 17 hours 8 min & 34 secs

or
Badir's work rate
60m² ÷ 15 hours = 4m² / h
Ornella's work rate
60m² ÷ 20 hours = 3m² / h
Total ⇒ 7m² / h

Answer
120m² ÷ 7 hours ⇒
17 hours 8 min & 34 seconds

E87. "Guess & revise"
Manda 67
Vicki 37
Clea 17

E88a. Nikki
3⅓ hours x 5km/h = 16.6km
outside Lorne
Laura
3⅓ hours x 10km/h=
33.3km
outside Torquay
⇒ Meet at 11.20am

b. Nikki
10 hours x 5km = 50km
Laura
10 hours x 10km = 100km
Met in Torquay at 6pm

E89. 14 possible combinations
[10x $1]
[8x $1, 1x $2]
[6x $1, 2x $2]
[6x $1, 1x $4]
[4x $1, 3x $2]
[2x $1, 4x $2]
[2x $1, 2x $4]
[2x $1, 1x $8]
[5x $2]
[3x $2, 1x $4]
[1x $2, 2x $4]
[1x $2, 1x $8]
[1x $4, 1x $2, 4x $1]
[1x $4, 2x $2, 2x $1]

E90. 1st half x = lemonade
y = icy-poles
Therefore, to double numbers in the 2nd half sale time Ned sold 4x lemonade at half-price sold 4y icypoles at half-price

Set-up a 'costs' table

L1st	P1st	L2nd	P2nd	Cost
10	5	40	20	$18
20	10	80	40	$36

Answer
1st half
Lemonade 20 x 50¢ = $10
Icy-poles 10 x 20¢ = $2
2nd sale half
80 x 25¢ = $20
40 x 10¢ = $4

Challenges 91 → 100

These are open-ended questions, with no set solutions. Please refer to introductory sheet 3 for a thorough explanation