

Spirit of Math

Brain Bogglers II

1) 3 consecutive numbers that add up to 9

$$2+3+4=9$$

∴ the highest number is 4

∴ it just finished striking 4 o'clock

# of Regions	Names	Total
1	A,B,C,D,E,F,G,H	8
2	AB, DC, EF, GH, AE, BF, CG, DH	8
4	ABCD, AEBF, CGDH, BFCG	4
8	ABCDEFGH	1

$$8+8+4+1=21$$

∴ there are 21 triangles

3) Numbers below are immediately after deliveries

Day 1 $40+200$ 240

Day 2 $240-180+200$ 260

Day 3 $260-180+200$ 280

⋮

Day 10 $400-180+200$ 420

Day 10 → Feb 12

So he will have 420 spring rolls on February 12.

Brain Bogglers 11

4) $23 + 18 = 414$ total students

$414 - 41 = 373$ students present

5) Units digit is only affected by other unit's digits
 $9 \times 7 \times 3 = 189$
∴ unit's digit is 9

6) Mr Aliwali, Mrs. Aliwali, 3 daughters, 2 brothers
= 7 members

7) $6 + 23 - 1 = 28$ rows

$28 \times 2 = 56$ bunches

$56 \times 14 = 784$ seats

8)
$$\begin{array}{r} 6.5 \\ \times 11 \\ \hline 13 \\ 22 \end{array} \quad \leftarrow \times \frac{2}{2}$$

9) $(135 + 75) \times 2$

= 210×2

= 420 km

Unit of Math.

Brain Bogglers II

10) $12 - 3 + 4 + 5 + 6 + 7 + 8 - 9 = 30$

11) $98 + 7 + 6 + 5 + 4 + 32 + 1 = 153$

12) $26 - 1 = 25$

$25 \times 4 = 100$ m apart

13) $\boxed{x} = x^2$ $\boxed{x} = x^3$

$A = 7$ and $B = 6$

$7 - 6 = 1$

$(2(7))^2 + 20 = 216 = 6^3$

14) $48 \times \frac{1}{3} = 16$

$48 \times \frac{1}{4} = 12$

$48 - 16 - 12 = 20$ cookies remaining

15) Next highest palindrome is 187781

$187781 - 186681 = 1100$

$1100 \div 11 = 100$ Km/hr

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16) $100 - 57.20 = 42.80$

$$57.20 - 42.80 = 14.40$$

17) 0Q 19N

1Q 14N

2Q 9N

3Q 4N

4 ways

18) 3, 7, 10, 17, 27,

To get an difference, add the 2 previous differences. (ex. $4+3=7$)

$$27 + (7 + 10) = 44$$

$$44 + (10 + 17) = 71$$

19) $51 \div 45 = \frac{17}{15} \text{ km/min}$

$$\frac{17}{15} \times 60 = 68 \text{ km/hr}$$

20) $1 - \frac{1}{5} - \frac{1}{4} - \frac{1}{4}$

$$= \frac{20-4-5-5}{20}$$

$$= \frac{6}{20}$$

$$= \frac{3}{10}$$

Unit of Math.



Brain Boggles II

21) 8 9s

9999999800000001

22) Only 2 summer months that have 30 days are June and September but June 16th is spring

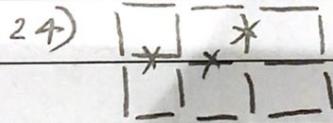
∴ Sept 16

23) $360 \div 12 = 30$

~~30 × 0.75 = 22.5~~

~~90 - 22.5 = 67.5~~

76



25) $96 + 59 + 32 = 187$

$187 = CLXXXVII$

I = 1 L = 50

V = 5 C = 100

X = 10

26) $(7 \div 7 + 7) \times 7 = 56$

Brain Bogglers

27) $18 - 17 = 1$
 $17 - 9 = 8$
 $9 + 18 = 27$
 $27 + 8 = 35$
 $35 + 1 = 36$
 $36 + 6 = 42$

28) $1 + 2 + 18 + 2 = 32$ picks

29) $(1 \times 3) + 1 = 4$
 each color

30) $15 \div 2 = 7.5$ skirt, 18 hours, 6 seamstresses
 $7.5 \times \frac{4}{6} = 5$ skirts, 8 hours, 4 seamstresses

31) $\frac{1}{2} \times 12 \times 12 + 2 = 144$
 $\frac{1}{2} \times 2 \times 12 \times 12 = 144$

∴ they are equal

32) $\begin{array}{r} 3 \\ \times 20 \\ \hline 60 \end{array}$
 $\begin{array}{r} 1 \\ \times 5 \\ \hline 5 \end{math>
 $\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{math>
 \hline
 $7 \text{ coins} \qquad \qquad \$71$$$

33) $\begin{array}{r} 853 \\ \times 764 \\ \hline 651692 \end{array}$

spirit of Math.



Brain Bogglers II

34) $1\frac{1}{2} \text{ hours} = 5400 \text{ secs}$

$$5400 \times 2\frac{1}{2} = 13500 \text{ cm}$$

$$13500 \div 100 = 135 \text{ m}$$

35) 13 Qs, 4 Ds, 0 Ns, 4 Ps

$$13(25) + 4(10) + 0(5) + 4(1) = \$3.69$$

36) $512 - 68 = 444$

$$444 \div 2 = 222$$

trs $222+1 = 223$ (Because both 68 and 512 cont.)

37) $9-8+7-6+5-4-3+2-1=1$

38) $18-1 = 17 \text{ intervals}$

$$17 \times 20 + 35 + 35 = 410 \text{ cm}$$

39)

40) $374 \div 4 = 93.5$

$$92 + 93 + 94 + 95 = 374$$

Brain Bogglers II

41) $2 \times 5 = 10$ (adds a 0)

There are less 5s than 2s under 76

$$76 \div 5 = 15 \text{ R}1 \rightarrow 15 \text{ numbers that are divisible by } 5$$

$$15 \div 5 = 3 \rightarrow 3 \text{ numbers that are divisible by } 25$$

$$15 + 3 = 18 \text{ terminating zeros}$$

42) 9865

$$\begin{array}{r} + 765 \\ \hline 10630 \end{array}$$

43) 16, 36, 64, 81, 100

$4^2, 6^2, 8^2, 9^2, 10^2$ all composite numbers

$$12^2 = 144$$

$$14^2 = 196$$

44) $\text{LCM}(24, 36) = 72$

$$72 \div 24 = 3 \text{ hr}$$

$$72 \div 36 = 2$$

$$3+2=5$$

∴ 72 mins or 1 hr and 12 mins



Unit of Math.

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76

divisible
by 5
by 25

45) IX

46)

47) There are only 10 perfect cubes under 759. (0^3 - 9^3). Out of these, look for one whose square is less than 759. (0, 1, 8, 27 are remaining). Try each one and you will get 27.

48) $87 \times 5 = 435$ total score

$$89 \times 6 = 534$$

$$534 - 435 = 99$$

49) $0.\overline{63} = \frac{5}{6}$

6 children + 2 parents = 8 members

50) Brain Boggles 11

$$135 + 85 + 154 = 374$$

$$374 - 2 = 372$$

(don't count the first and last)

$$372 + 2 = 374 \text{ (Back cover of V1 and Front of V2)}$$

$$374 + 2 = 376 \text{ (Front and back covers of book)}$$

51) $024 \div 86 = \frac{12}{43}$

52) $b + y = 14$

$$y + r = 18$$

$$r + b = 12$$

$$2b + 2y + 2r = 44$$

$$b + y + r = 22$$

53) let x rep dist to school

$$\cancel{x} \cancel{\div 2} = 3$$

$$x = 6^{2 \times 2}$$

55) $6x + 4y = 5.2$

$$4x + 6y = 4.8$$

$$12x + 8y = 10.4$$

$$12x + 18y = 14.4$$

$$\cancel{-10y} = -4$$

$$y = \frac{2}{5} \quad 2 \div 10$$

spirit of Math.

Brain Boggliers II

56) Os from $1-10 = 1$

Os from $11-100 = 10$

Os from $101-200 = 20$

Os from $201-300 = 20$

:

Os from $1-1001 = 11 + 8(20) + 21 = 192$

57) $\sqrt[3]{21924} \approx 28$

$28 - 1 = 27$

the 3 #'s are:

$28 + 1 = 29$

27, 28, 29

58) 7994

$$\begin{array}{r} * 6 \\ 47964 \end{array}$$

59) 1. Orville & Leslie

2. Jack & Nancy

3. Marty & Kelly

60) $6\frac{1}{7} \times 6 = 37\frac{1}{2}$ hours per week

$37\frac{1}{2} \div 5 = 7\frac{1}{2}$ hours per day

61) $32 \div 4 = 8$ km far when his mom leaves (6:15)

6:16:

Jack is at $8\frac{8}{15}$ km }
Mom is at $\frac{13}{15}$ km } $7\frac{2}{3}$ km apart / $\frac{1}{3}$ km closer

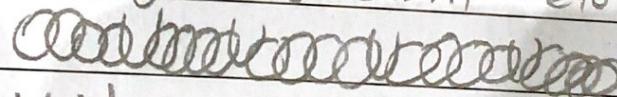
$$8 \div \frac{1}{3} = 24$$
$$24 + 15 = 39$$

6:39

64) 3:00 6:00
14 14 14 14 14 14 14
 20secs

66) Cut each of the 4 links in one chain.

Arrange as shown below



Weld the 4 back

$$4(1.25) + 4(3.50) = \$19.00$$

Chirit of Math.

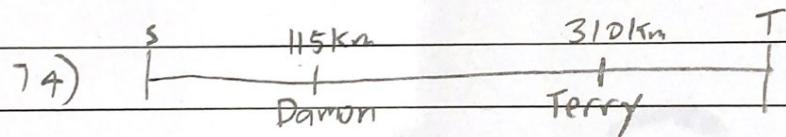
es (6:15)

69) Speed Up-Stream: $10+6 = 16 \text{ Km/hr} \rightarrow 1 \text{ hr}$
 Speed Down-Stream: $10-6 = 4 \text{ Km/hr} \rightarrow 4 \text{ hrs}$
~~+ closer~~ Total distance: $16 + 16 = 32 \text{ km}$

$$32 \div (1+4) = 6.4 \text{ Km/hr}$$

72) A - $34567 \cdot 56789^2$
 B - $34567^2 \cdot 56789$
 C - $45678 \cdot 56789^2$
 D - $34567 \cdot 45678^2$

C

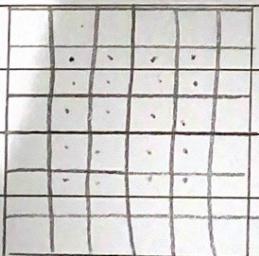


$$310 - 115 = 195 \text{ km apart}$$

84) $-2+9-1-2-1-1=2$

Sep 30 + 2 = Oct 2

89)



16 per side
 $16 \times 6 = 96$

$$) 1+2+9+6\ 4+625-+216+49+8+1 \\ = 975$$