

DAWSAN'S
MATHS EXPRESS

S.Edwards and D.Williams

*Cryptic
Maths*

NAME



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Maths
EXPRESS

S. Edwards & D. Williams

These fun calculations are devised
to be to be used in conjunction with the
Dawsan's Maths Dictionary.

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FIGURING UPS AND DOWNS

Look at the grid at the below. The number 19 (answer to clue 25-Across), has been entered as a starting point. The clue for 25-Across reads: "Two less than 22-Down". You can now enter the answer to 22-Down. Continue solving by going from clue to clue in this manner.

1.	2.		3.		4.		5.	6.
7.					8.			
			9.	10.				
11.		12.				13.		14.
		15.						
16.	17.					18.	19.	
			20.		21.			
22.					23.			24.
25. 1	9		26.				27.	

Clues ACROSS

1. Two-thirds of 22-Down
3. Square of 1-Down
5. Three more than 27-Across
7. 13-Across multiplied by 25-Across
8. 5-Down minus 4-Down
9. Twice 3-Down
11. Seven times 5-Across
13. Forty more than 11-Across
15. Square of 21-Down
16. Twice 11-Down
18. Five hundred less than 4-Down
20. 3-Down minus 1-Across
22. 5-Across multiplied by 27-Across
23. 3-Down plus 7-Across
25. Two less than 22-Down
26. 22-Down multiplied by 24-Down.
27. Last two digits of 26-Across

Clues DOWN

1. Two less than 25-Across
2. Six times 16-Across
3. 3-Across minus 1-Across
4. Three times 14-Down
5. 2-Down minus 24-Down
6. Twice 5-Across
10. 1-Across multiplied by 2-Down
11. 1-Down multiplied by 22-Down
12. Thirty less than 13-Down
13. 1-Across multiplied by 24-Down
14. 3-Across plus 22-Down
17. Three times 11-Across
19. 8-Across plus 24-Down
20. 11-Across minus 6-Down
21. The 2nd digit is the sum of the other two
22. Five less than 24-Down
24. First two digits of 20-Across

EQUATIONS

Each of the nine letters in each sum stands for the numbers 1 to 9, but no two letters stand for the same number. Using the clues, can you deduce the number represented by each letter?

i) 1) All three numbers in one row across are odd, and the smallest of these is in the middle.

2) $X = W + 2$

3) $T = R^2$ and $V = S^2$

4) $P = S \times V$

P	S	X
Q	T	V
R	U	W

(ii) 1) $I \times K = K$

2) $M + P = M \times M$

3) $H \times H = L$

4) K is not 5

5) $K + O$ is one less than $J + N$

6) $J > N$

H	I	J
K	L	M
N	O	P

OPERATING NUMBERS

Each letter in each of the sums below represents a digit from 0 to 9. In each individual sum a specific letter stands for the same digit. When a digit appears in a sum, none of the letters in that sum will represent that digit. So, A, B and C in the first sum cannot stand for 3, 5, 6 or 7.

$$\begin{array}{r}
 1. \quad A \ B \ B \ A \ A \\
 \quad \quad 3 \ A \ A \ 6 \\
 + \quad \underline{6 \ A \ 7 \ A} \\
 \underline{A \ C \ 5 \ A \ B}
 \end{array}$$

$A = \underline{\hspace{2cm}}$

$B = \underline{\hspace{2cm}}$

$C = \underline{\hspace{2cm}}$

$$\begin{array}{r}
 2. \quad \quad \quad A \ 5 \ B \\
 \quad \quad \underline{X \quad \quad 8 \ B} \\
 \quad \quad \quad C \ 0 \ C \ 6 \\
 \underline{A \ 0 \ D \ A \ 0} \\
 \underline{A \ C \ D \ D \ 6}
 \end{array}$$

$A = \underline{\hspace{2cm}}$

$B = \underline{\hspace{2cm}}$

$C = \underline{\hspace{2cm}}$

$D = \underline{\hspace{2cm}}$

$$\begin{array}{r}
 3. \quad 6 \ A \ B \ 7 \ B \\
 - \quad \underline{C \ 4 \ B \ A \ 5} \\
 \underline{C \ C \ 9 \ A \ 5}
 \end{array}$$

$A = \underline{\hspace{2cm}}$

$B = \underline{\hspace{2cm}}$

$C = \underline{\hspace{2cm}}$

SUM STICKLERS

1. I counted a total number of spiders and ants in an old cupboard. I also counted a total number of 168 legs. Find the number of spiders and ants. (Clue: Ratio)
2. A regular polyhedron that has 20 faces is called an icosahedron. This is the largest number of faces that can be formed on a regular polyhedron. Each face forms the shape of an equilateral triangle which means it will have 12 vertices. If an icosahedron has 20 faces and 12 vertices, find the number of edges.
(Clue: $V + F - 2 = E$)
3. The difference between the squares of two consecutive numbers is 53. What are the two numbers? (Clue: The difference between the squares of two consecutive numbers is always one more than twice the lower number).
4. If the fraction $\frac{7}{17}$ has the same number added to both the numerator and the denominator the fraction is changed to $\frac{3}{5}$. What number is added to the numerator and the denominator? (Clue: The number is < 10)
5. The price of an article was cut by 20% for a sale. By what percent must the item be increased to sell the article at the original price? (Clue: The answer is not 20%)
6. Mary, after eating one gumdrop, gave her sister, Jane, half of the remainder. Mary ate another gumdrop and gave half the remainder to her brother, Tom. Mary had 5 gumdrops left. How many did she start with?
7. REPORTER: How many marriages have you performed since you were ordained?
MINISTER: Well, when I divide the number by 2, by 3, by 5 or by 6, I have exactly 1 left over. But when I divide by 7 there is nothing remaining.
Meeting these conditions, what is the minimum number of marriages the minister performed?

SUMMING- UP

Place the numbers on the outside of the square into the empty squares in the box in such a way that the five numbers of each row across, each column down, and each of the two diagonals will total 77. Numbers may not be repeated in any one row, column or diagonal. Each number must be placed in one of the boxes of the same row or column outside of which it appears. For example 2 must be placed somewhere in the left-hand column.

HINT: Start with the last column where 21 has been inserted. You know that 13 must go into that column (along with 14 already entered). The total of 48 subtracted from 77 leaves you with 29. The only two numbers that will total 29 are 5 and 24. Enter these two numbers. Now fill in the 13. Continue solving the puzzle in this way.

	2	23	25	14	21	
5		31				6
11					14	17
27			12			21
24	15					1
2				3	21	26
	13	4	33	22	13	

PLACE YOUR NUMBERS

To solve each number place, place a number into every box so that each row across, column down and all nine small 9-box squares will contain the numbers 1 to 9. No number may appear more than once in any row, column, or 9-box square.

	8	7	6		4		3	
6			9	7	1			5
4			3			1		6
		1	2			3	8	
9	2		1	8				7
	6		7	4	5	9		
		9	4				5	8
8			5	9			1	
	7	3	8		6	4		

7		6	3				5	
	5			9	4			2
	3		5				6	8
		8	1		7			3
				5	8	6		9
2	1	5					4	
1	9	7				2		
			8	2	6	7		
6				1		4	3	

7	9	4	2					
				3	6	4		5
5				7		2	8	
				4	3			7
	1	5			7	8		
		9	8				5	6
9			1	6				2
	4		3		5		9	
1		3				6	4	

CRYPTIC CROSS-NUMBER/WORD

1.			2.					3.			4.		5.
										6.			
		7.			8.								
9.					10.								
												11.	
12.			13.			14.		15.					
												16.	
			17.		18.								
19.		20.			21.								22.
23.	24.		25.				26.				27.		
28.									29.				
						30.							

ACROSS:

1. Port Carrot makes a mathematical measuring device.
4. Total addends.
7. First composite.
9. 49 Romans.
10. 1 square mile =(s)
11. Morning!
12. Cheat 20 Romans. (2 words: 6/5)
16. Nightly speaking!
17. Sounds like part, but it's the total.
19. To the British it's 8 furlongs.
21. More or less.
23. Opposite of prime
27. If these letters are in front, it's three
28. A nasty average!
30. Number one in the order of operations!

DOWN:

1. Mom or dad perhaps, or maybe 1 991!
2. It's even prime!
3. 2 : Twice as 1:?
5. Sounds like a little mother, at least!
6. Dash for take-away! (2 words 5/4)
8. Measurement of speed perhaps?
13. Side of a polygon, not always the bottom
14. 900 in Rome.
15. A half can be described as 1 2
16. Sounds like steak& kidney, but worth \approx 3,14
18. Grams or Kilograms for example.
20. 20's relationship to 2, 4, 5 and 10.
22. Single digit
24. 1st counting, 1st natural.
25. 4 gills to the British
26. If written in front of a word, it's four.
27. $1 + 2 \neq 3$ False $1 + 2 = 3$
28. 1 001 Romans
29. 95 in Rome

FUN-FOLLOW-ON

Work carefully as each question is dependent on the preceding answer. (Note: Fractions are not used in this exercise).

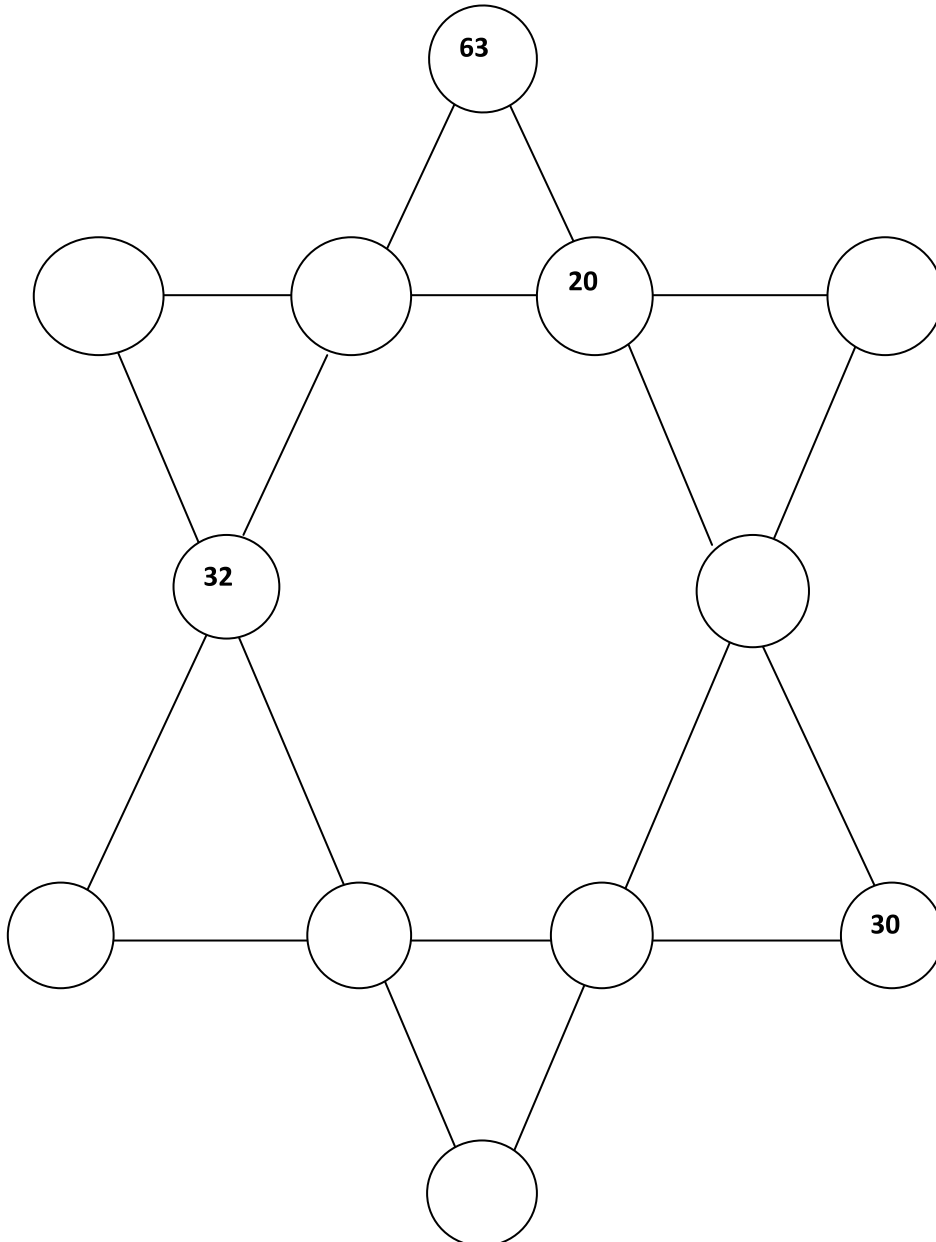
1. Take the number of the first month with thirty days and multiply it by the third month with 31 days.
2. Add 60% of 60 to your previous answer.
3. Divide number 3's answer by the number of baker's dozens in 52.
4. LIVE is to EVIL as 6131 is to what number? Add this number to number 3's answer.
5. If each rabbit can jump 5 feet high, how high can two rabbits jump? Divide number 4's answer by this number.
6. Now subtract the total number of singers in the following group:
a trio of tenors, a double octet, two sextets, a pair of baritones, four quintets and a solitary soprano.
7. If 277 is a prime number divide your answer by 4, if not, divide by 5.
8. From number 7's answer subtract the number of misspelled words in the following foursome: TRISKAIDEKAPHOBIA; MILLENIUM; RECIPROCAL; PARRALLELOGRAM.
9. From your previous answer subtract the following: 40 times 2 divided by 2 minus what number equals 11?
10. Increase your previous answer by the total number of years in 3 decades, 4 centuries, 2 millennia and 3 score years and 10.
11. Increase your previous answer by 25% of 316. Now find the square root.
12. Multiply your previous answer by 13 and add the 2nd prime number.

My answer is palindromic. Is yours?

NUMBER STAR

Fill in the empty circles using only the numbers given below in such a way that each straight line formed by four circles equals 100. Negative numbers are to be subtracted from positive numbers. The missing numbers are:

-108; -55; -13; 12; 18; 83; 105; 113



MAGIC SQUARE

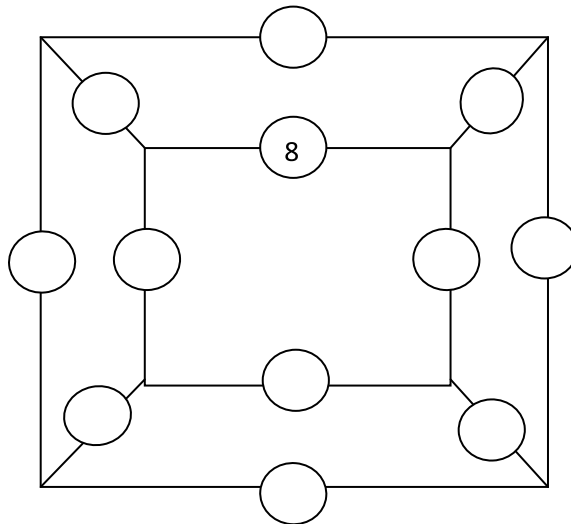
1. The magic number for this number square is 1 859. Fill in the empty boxes of the diagram in such a way that the following conditions are met: the four numbers in each row, each column, each diagonal, the four centre boxes and the four corner boxes each add up to 1 859, using only the numbers listed below. Do not use the same number more than once. Some numbers have been entered to start you off.

The missing numbers are: 194; 315; 411; 522; 554; 586; 618; 732; 764; 796.

	347	162	828
	98		
379			130

-
2. Using only the numbers given below, fill in the empty circles in such a way that the sum of each 4-sided figure (the middle square, the outer square, and the four trapeziums) is 91.

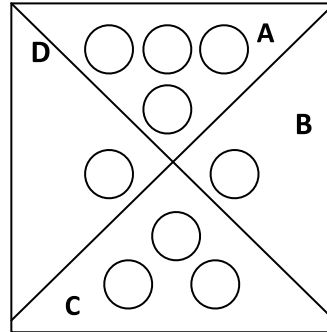
The missing numbers are: 13; 15; 16; 24; 28; 30; 38; 40



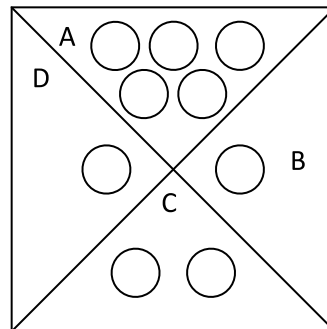
DEDUCE IT

Place the numbers 1 to 9 in the circles in each diagram below so that the statements to the left of them are correct. Find the total of each section A to D by adding up the numbers in the circles in that section.

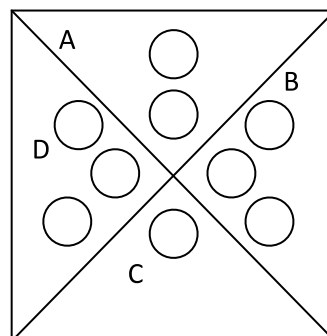
1. $A = C$
 $B = 2 \text{ times } D$



2. $A = 2 \text{ times } C$
 $B = \frac{1}{3} \text{ of } D$



3. $B = D$ (with D containing a prime number)
 $A = 4 \text{ times } C$ (C having only odd numbers)

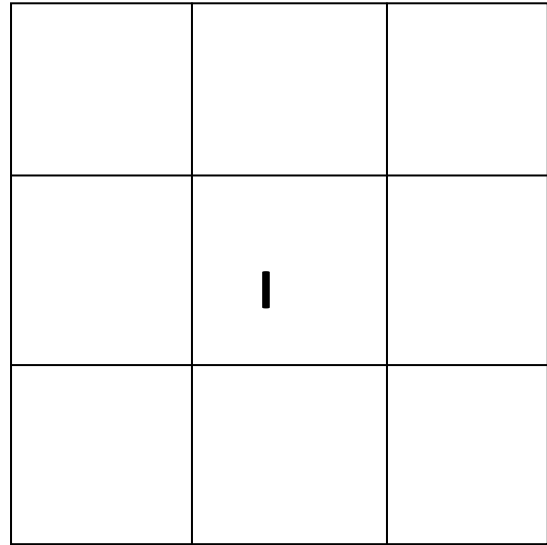


NUMBER LOGIC

The challenge here is to position the nine squares on the left in the diagram in such a way that wherever two squares touch sides, the numbers are identical. Do not turn the squares or rearrange the numbers within a square. The square that goes in the centre is given.

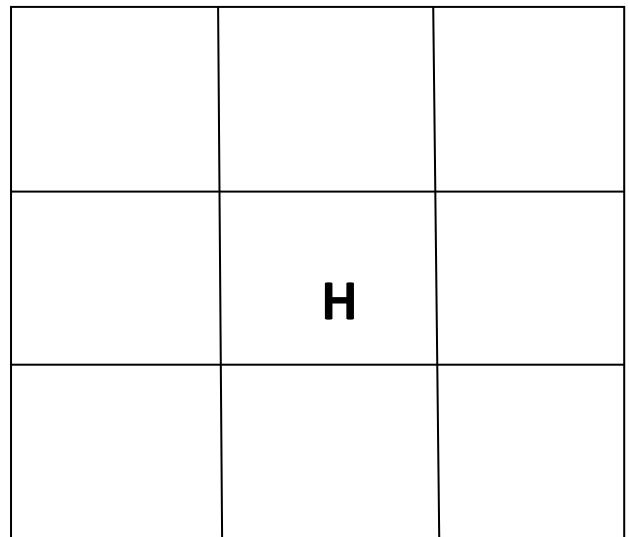
1.

9. 10. A 8. 7.	10. 9. B 8. 7.	10. 9. C 7. 8.
7. 8. D 9. 10.	7. 8. E 10. 9.	10. 8. F 7. 9.
9. 7. G 8. 10.	8. 7. H 9. 10.	9. 7. I 8. 10.



2.

5. 6. A 7. 4.	4. 7. B 6. 5.	4. 5. C 6. 7.
6. 7. D 4. 5.	7. 4. E 6. 5.	5. 7. F 4. 6.
5. 4. G 7. 6.	5. 6. H 7. 4.	4. 6. I 7. 5.

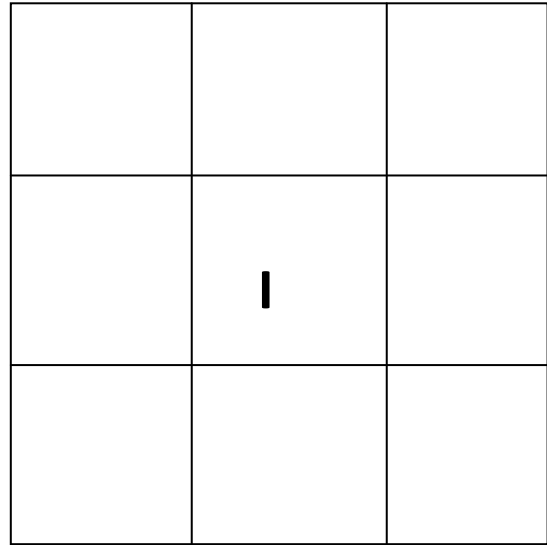


NUMBER LOGIC

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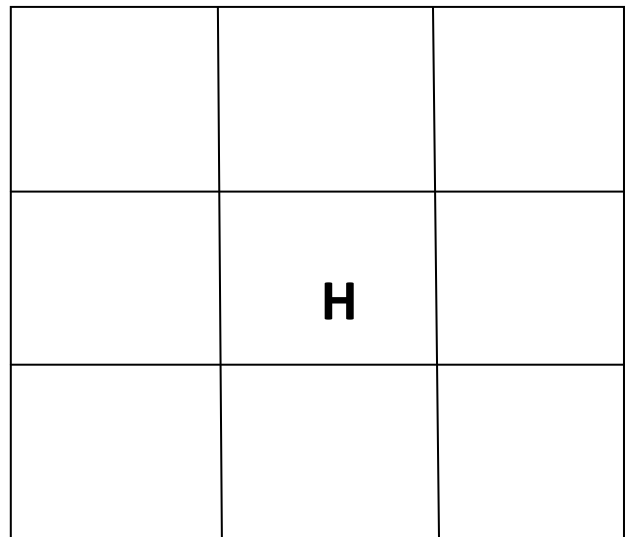
1.

9. 10. A 8. 7.	10. 9. B 8. 7.	10. 9. C 7. 8.
7. 8. D 9. 10.	7. 8. E 10. 9.	10. 8. F 7. 9.
9. 7. G 8. 10.	8. 7. H 9. 10.	9. 7. I 8. 10.



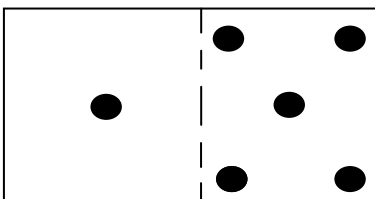
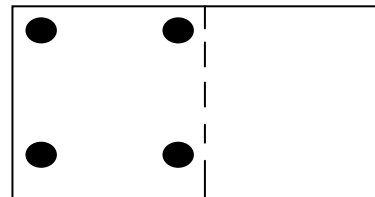
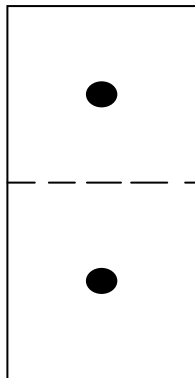
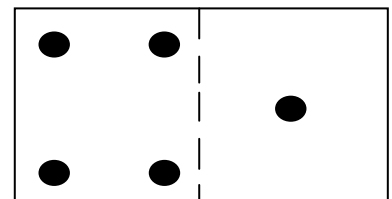
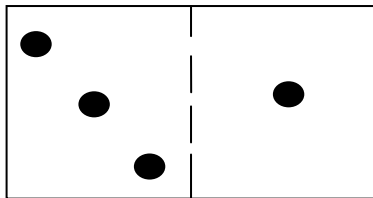
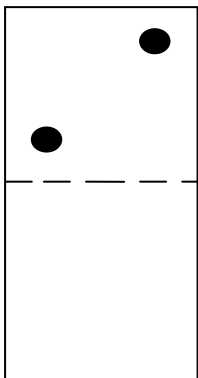
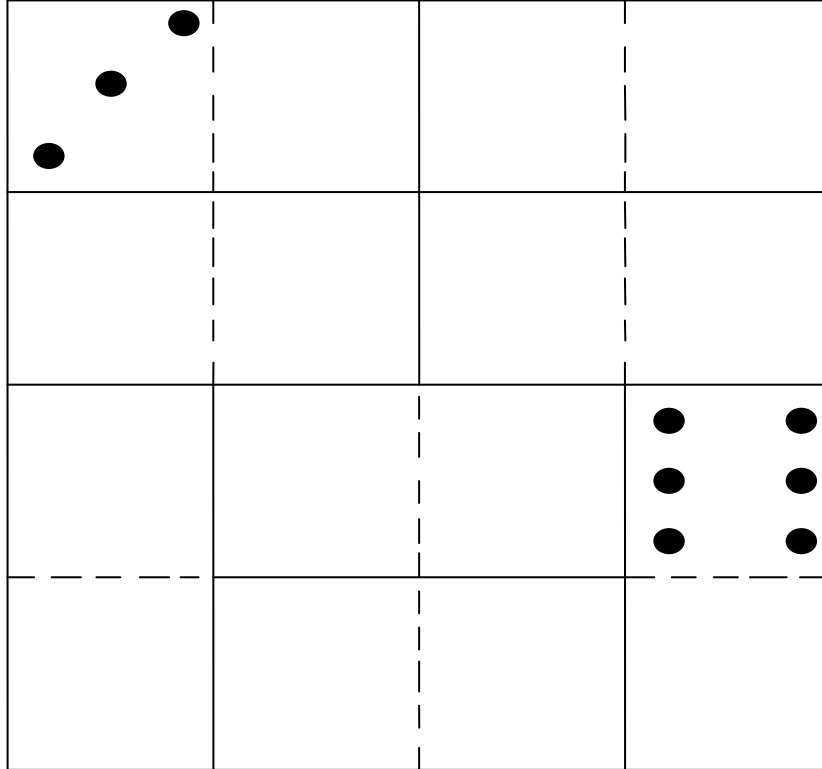
2.

5. 6. A 7. 4.	4. 7. B 6. 5.	4. 5. C 6. 7.
6. 7. D 4. 5.	7. 4. E 6. 5.	5. 7. F 4. 6.
5. 4. G 7. 6.	5. 6. H 7. 4.	4. 6. I 7. 5.



DOTTY DOMINOES

Place the dominoes into the grid so that the four vertical, horizontal and both diagonal rows each have a spot total of eight.



CANCELLATIONS 1

Cross off the words in each of the categories. The words left over will read out an English proverb.

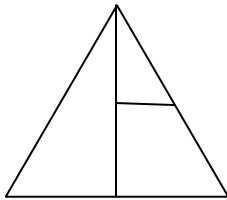
Ton	Pentagon	Semi	Octo	Pound	Prime	Product	Equilateral	Quint	Straight
Century	Trapezium	Fortnight	Gram	Common	Algebra	Isosceles	Denominator	Cube	Pyramid
Hexagon	Histogram	Multiplier	Pint	Bar	Square	Acute	Multiplicand	Duet	Season
Decimal	Prism	Kilogram	Kite	Tetra	Counting	Reflex	Frequency	Quart	Nonagon
Septet	Scalene	Numerator	More	Decade	Gallon	Vulgar	Trigonometry	Trio	Haste
Obtuse	Triangle	Natural	Gill	Less	Rhombus	Celsius	Fahrenheit	Pie	Speed

1. Four types of angles _____
2. Three types of triangles _____
3. Two parts of a fraction _____
4. Three indicating position in a multiplication sum. _____
5. Four quadrilaterals. _____
6. Three words preceding the word fraction. _____
7. Four polygons. _____
8. Two branches of Mathematics. _____
9. Four measurements of time. _____
10. Four types of graphs. _____
11. Four British units of liquid measurement. _____
12. Three 3-dimensional figures. _____
13. Four measurements of mass. _____
14. Three special words for groups of people. _____
15. Four prefixes denoting a number. _____
16. Two measurements of temperature. _____
17. Three categories in which 3 belongs e.g. Odd _____

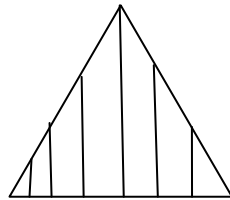
ENGLISH PROVERB: _____

TRIANGLE NUMBERS

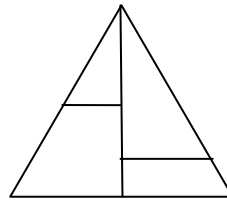
Each letter in the quotation is represented by a number. To determine that number, count the number of triangles in each of the triangles next to the letter. Then place that letter on the corresponding blank and so reveal the quotation.



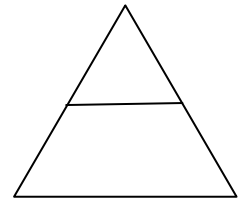
E



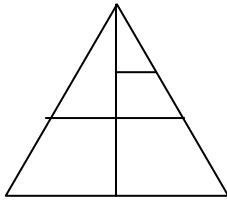
O



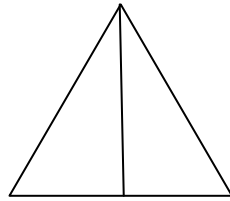
Y



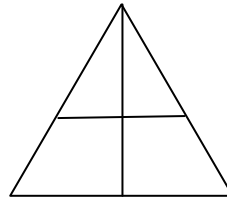
T



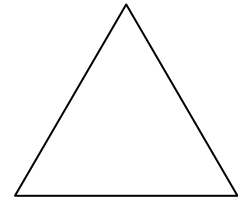
I



N



M



S

— — — —
2 7 6 4

— —
7 1

— — — — —
6 8 3 4 5

ANOTHER CRYPTIC CROSS-NUMBER/ WORD

1.										2.			
				3.		4.						5.	
6.													
			7.						8.				
									9.				
		10.					11.						
						12.							
13.													
			14.										15.
		16.											
17.										18.			
				19.									

ACROSS:

1. Can you eat this graph?
3. Also known as a trapezium.
6. A boy's name but also a line that goes on forever.
7. Can this quadrilateral fly?
9. In true quality, they're identical.
10. Ice-cream is associated with this solid figure.
11. Stir one thousand and forty-nine Romans.
13. 12 is related in this way to 2, 3, 4 and 6.
14. This polygon is very important in the U.S.A.
17. Some correct angle is also a quadrilateral!
18. This number is twice as powerful as three!
19. Number 18's answer as a polygon.

DOWN:

1. Two arrow heads heading north and two heading east, identify this quadrilateral.
2. Not reversed is 1 016kg!
3. This polygon sounds as if you're attempting to fish!
4. The result is it's a square measurement.
5. Is this polygon based on our number system?
8. This polygon has the same number of sides as a cube has faces.
12. Is a sea-creature with tentacles this shape?
15. Seven is at odds but it spells out otherwise.
16. 640 race to get a square mile!
18. This prefix describes 18 Across.

SOME MORE EQUATIONS

In the following square, use the Across and Down clues to determine which of the numbers 1 to 9 belongs in each square. Digits may be repeated in a column or row and no 0's are used.

i) ACROSS

1. See 2-Down.
4. The first digit (an even number) is four more than the sum of the 2nd and 3rd digit.
5. The first digit is the sum of the 2nd and 3rd digits.

DOWN

1. Three consecutive numbers in ascending order, from top to bottom.
2. A half of 1-Across.
3. All three digits are the same number.

1.	2.	3.
4.		
5.		

ii) Each of the nine letters below stand for one number from 1 to 9, but no two letters have the same value. Using the clues below , find the number represented by each letter.

1. $H^2 = I + L$

2. $\sqrt{L} = P - J$

3. $O \times M = N + K$

H	I	J
K	L	M
N	O	P

NUMBERS AND LETTERS

Thinking mathematically, what do these numbers and letters stand for. The first one has been done for you.

- | | | | |
|------------------------------|---------------------------|--------------------------|-------|
| 1. 180 d.i.a.t | 180 degrees in a triangle | 2. 4 s.o.a.s | ..... |
| 3. 8 s.o.a.o | ..... | 4. 20 i.a.s | ..... |
| 5. 366 d.i.a.l.y | ..... | 6. 60 s.i.a.m | ..... |
| 7. 1 000 y.i.a.m | ..... | 8. 3 s.o.a.t | ..... |
| 9. 14 d.i.a.f | ..... | 10. 10 y.i.a.d | ..... |
| 11. 144 i.a.g | ..... | 12. 500 R.n.D | ..... |
| 13. 180 d.i.a.s.a | ..... | 14. 10 s.o.a.d | ..... |
| 15. 13 i.a.b.d | ..... | 16. 100 y.i.a.c | ..... |
| 17. 12 d.i.a.g | ..... | 18. 9 s.o.a.n | ..... |
| 19. 2 o.e.p.n | ..... | 20. 6 f.o.a.c | ..... |
| 21. 0 f.c.n | ..... | 22. 1 f.n.n | ..... |
| 23. 360 d.i.a.q | ..... | 24. 24 h.i.a.d | ..... |
| 25. 3,14 a.v.o.p | ..... | 26. 7 d.i.a.w | ..... |
| 27. 29 d.i.F.i.a.l.y | ..... | 28. 1 728 i.a.g.g | ..... |
| 29. 100 c.i.a.R | ..... | 30. 50 R.n.L | ..... |
| 31. 90 d.i.a.r.a | ..... | 32. 12 g.i.a.g.g | ..... |
| 33. 1 000 m.i.a.l | ..... | 34. 2 i.a.b | ..... |
| 35. 360 d.i.a.r | ..... | 36. 5 s.o.a.p | ..... |
| 37. $365\frac{1}{4}$ d.i.a.y | ..... | 38. 6 s.o.a.h | ..... |
| 39. 42,2 n.d.o.a.m | ..... | 40. $\frac{22}{7}$ v.o.p | ..... |

WHAT IS THAT NUMBER?

1. Three quarters of a number is two-thirds of 63. What is that number?
2. Two-fifths of three-quarters of a number is 19,2. What is that number?
3. The square root of a number is two times the cube root of 125. What is that number?
4. The square root of a number minus 10 is the fourth root of 16. What is that number?
5. Six times a number is half the square root of 144. What is that number?
6. Three-fifths of two-thirds of a number is twice the square root of 81. What is that number?
7. Half of a number is three times the cube root of 125. What is that number?
8. Five times a number is two-thirds of 66. What is that number?
9. Half of one quarter is eight times the square root of 121. What is that number?
10. Two-thirds of three-quarters of a number is 17. What is that number?
11. What number is equal to the square root of (half of 8^3 minus 60)?
12. Seven times a number is 3^4 plus the fifth composite number? What is that number?
13. A third of two-sevenths of a number is 42. What is that number?
14. A certain number is equal to the square root of (the third root of 8 plus 17). What is that number?
15. Five-eighths of a number is three-quarters of 85. What is that number?

PROBLEMATIC PROGRESSIONS

Find the next two numbers in each of the following sequences:

- 1.) 7; 9; 12; 14; 17; 19; ____ ; ____
- 2.) 15; 8; 16; 9; 18; 11; 21; ____ ; ____
- 3.) 1; 4; 9; 16; 25; 36; ____ ; ____
- 4.) 1; 5; 11; 19; 28; 38; ____ ; ____
- 5.) 1; 3; 6; 11; 18; 29; ____ ; ____
- 6.) 1; 4; 27; 256; 3125; ____ ; ____
- 7.) 1; 1; 2; 3; 5; 8; 13; 21; ____ ; ____
- 8.) 4; 3; 6; 4; 8; 5; ____ ; ____
- 9.) 16; 16; 8; $2\frac{2}{3}$; $\frac{2}{3}$; ____ ; ____
- 10.) 4; 5; 9; 18; 34; 59; ____ ; ____
- 11.) 22; $14\frac{1}{4}$; $6\frac{1}{2}$; $-1\frac{1}{4}$; ____ ; ____
- 12.) 34; 7; 29; 11; 23; 16; 16; 22; ____ ; ____
- 13.) 2 ; $\frac{1}{3}$; $\frac{1}{18}$; $\frac{1}{108}$; $\frac{1}{648}$; ____ ; ____
- 14.) 100; 99,5; 98,5; 97; 95; ____ ; ____
- 15.) 0,5; 0,75; 0,833; 0,875; 0,9; ____ ; ____
- 16.) 225; 196; 169; 144; 121; ____ ; ____
- 17.) 100; 51; $26\frac{1}{2}$; $14\frac{1}{4}$; ____ ; ____
- 18.) 2; 3; 4; 9; 8; 27; ____ ; ____
- 19.) 2; 5; 11; 23; 47; ____ ; ____
- 20.) 35; 24; 15; 8; 3; ____ ; ____

CODED ALPHABET

Each of the given letters of the alphabet has been assigned a specific value from 1 to 25.

It is your task to unravel the code and find the value of J. The values of F and G have been given as a starting point. For additional help read the clue at the bottom of the page.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	Y	Z	
					24	2			?																

1. $I \times U = F$

$_ \times _ = _$

3. $K + G = Q$

$_ + _ = _$

5. $C + U = D$

$_ + _ = _$

7. $G \times N = F$

$_ \times _ = _$

9. $S \times I = C$

$_ \times _ = _$

11. $S \times E = F$

$_ \times _ = _$

13. $Y + O = M$

$_ + _ = _$

15. $Z + V = K$

$_ + _ = _$

17. $L - U = B$

$_ - _ = _$

19. $B + G = H$

$_ + _ = _$

2. $P - Q = G$

$_ - _ = _$

4. $U \times W = R$

$_ \times _ = _$

6. $Z + E = B$

$_ + _ = _$

8. $Y + M = L$

$_ + _ = _$

10. $N + U = T$

$_ + _ = _$

12. $G + G = U$

$_ + _ = _$

14. $W \times W = P$

$_ \times _ = _$

16. $O + A = V$

$_ + _ = _$

18. $H - U = A$

$_ - _ = _$

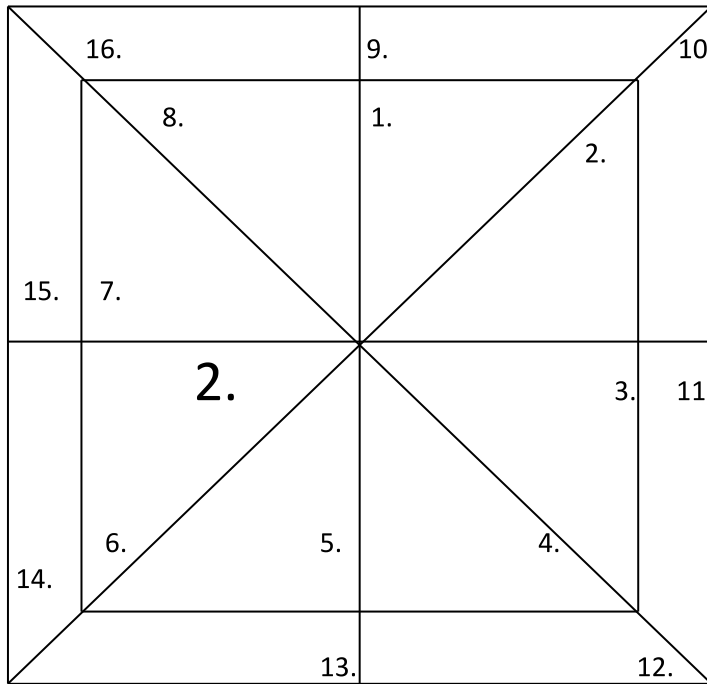
20. Y and O are square numbers.

$Y > O$. $_$ and $_$.

Starting tip: Given F and G, complete numbers 7 and 12. Now go to number 1. Next consider nos. 1, 7 and 11 (factors of 24).

NUMBER PICTURE

Fill in the diagram by answering the clues below. It will be necessary to work back and forth among the clues in order to solve one. The answer to each OUTWARD clue is a 2-digit number to be entered outward from the centre of the square. For example if the answer to clue (a) were 37, then you would enter a 3 in the space marked "1" and a 7 in the space marked "9". **Each space contains only one digit.** The answer to each CLOCKWISE clue is a three digit number to be entered in a clockwise direction. For example if the answer to clue (i) were 357, then you would enter a 3 in the space marked "1", a 5 in the space marked "2" and a 7 in the space marked "3". There are no zeros in this task. "In some order" means any order. One number is given.



OUTWARD

CLOCKWISE

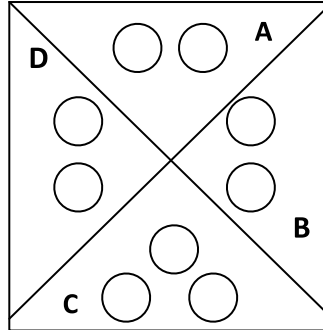
- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> (a) 1-9 Consecutive digits in some order (b) 2-10 Consecutive digits in some order (c) 3-11 Two times Outward 7-15 (d) 4-12 One digit is 3 more than the other (e) 5-13 One digit is 4 times the other digit (f) 6-14 Consecutive digits in some order (g) 7-15 A prime number (h) 8-16 Consecutive digits in some order | <ul style="list-style-type: none"> (i) 1-3 First digit is the sum of the second and third digits. (j) 3-5 Two of the digits are prime numbers (k) 5-7 Consecutive digits in some order (l) 7-1 Second digit is 2 times the first digit (m) 9-11 Two digits are squares > 1; the other is $\frac{1}{2}$ of one of them (n) 11-13 Two digits are squares; the other is 2 times one of them (o) 13-15 The third digit is divisible by the first; the third is 4th prime no. (p) 15-9 Consecutive odd digits in some order |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

HINT: Start with clue (m); move to clue (p); now read clue (a). Make some mathematical deductions and you're on your way.

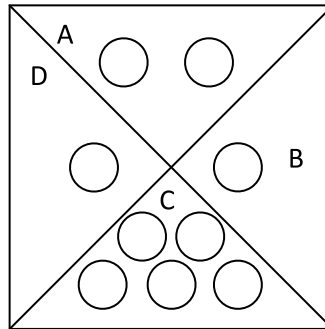
MORE TO DEDUCE

Place the numbers 1 to 9 in the circles in each diagram below so that the statements to the left of them are correct. Find the total of each section A to D by adding up the numbers in the circles in that section.

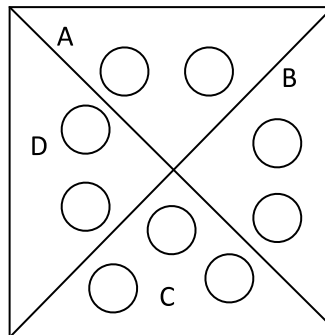
1. $A = \frac{1}{3} C$ (A having only even numbers)
 $B = D + 3$ (B having only prime numbers)
 (D having only square numbers)



2. $A = 17$
 $B^2 = D$
 $C = A + 5$



3. $A = B$ (A and B have four consecutive nos.)
 $D = \frac{1}{2} C$ (D having only prime numbers)



KNOCK-OUT

Cross off the numbers in each category. Arrange the remaining numbers to form a palindromic number.

Columns ↓ and Rows →

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56

1. Cross off all prime numbers in the 3rd row.
2. Cross off all multiples of three in the 4th column.
3. Cross off all numbers divisible by a decade.
4. Cross off all the factors of 16.
5. Cross off three consecutive numbers that total 132.
6. Cross off all square numbers in the 1st column.
7. Cross off all composite numbers in the 5th column.
8. Cross off the numbers represented by the prefixes Quindecia, hendeca, hepta, hexa and penta.
9. Cross off all multiples of 13.
10. Cross off all palindromic numbers between 20 and 40.
11. Cross off two addends in the 7th column with a sum of 86.
12. Cross off two numbers in the 7th row with a difference of 1.
13. Cross off two numbers in the 3rd column that give a product of 153.
14. Cross off all numbers in column 2 which when divided by 4 give a remainder of 2.
15. Cross off all numbers in the 4th row which when squared give a result of < 1 000.
16. Cross off all numbers in column 8 that are divisible by 2³.
17. Cross off the following values expressed in Roman numerals: XXXV, XLVI and XXXVIII
18. Cross off two numbers which have a difference of 10.

REMAINING DIGITS : _____

CROSS NUMBER

This puzzle works in exactly the same way as a crossword puzzle, except that you are filling in numbers instead of words.

1.		2.			3.		4.		5.
		6.		7.					
8.	9.			10.		11.			
12.		13.		14.				15.	
	16.					17.	18.		
	19.				20.				
21.			22.				23.		

ACROSS:

1. Sum of the first five multiples of 25.
3. $(4 \times 10^0) + (6 \times 10^2) + (8 \times 10^3) + (1 \times 10^4)$
6. Only palindromic number between 2 100 and 2 200.
8. 10th prime number.
10. Sum of 9 millennia, 2 centuries and 1 dozen.
12. Product of 3rd prime number and 24th prime number.
14. Number of days in 68 fortnights.
15. Total number of sides on 2 triangles, 1 pentagon, 1 octagon and 1 hexagon.
16. Number of faces on 1 336 cubes.
17. 3 centuries plus $\frac{1}{3}$ of the number of days in a leap year.
19. Number of minutes in $\frac{1}{6}$ of an hour.
20. Product of $\frac{1}{2}$ a dozen and $\sqrt{4\ 624}$.
21. $64 \times 0,25$.
22. The 7th multiple of 16.
23. The sum of 1 across and 12 across.

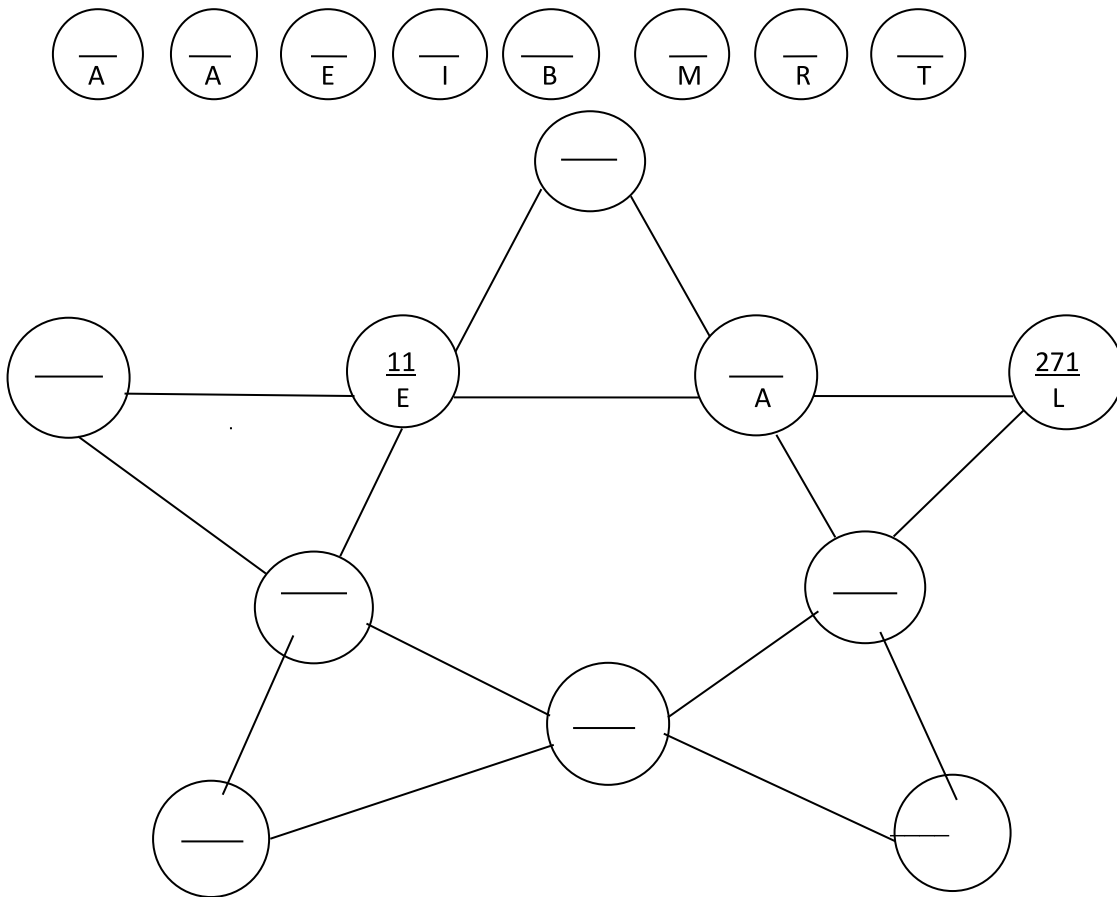
DOWN:

1. Find the dividend if the quotient is 151 and the divisor is 24.
2. $\sqrt{2\ 704}$
3. 35^2
4. Number of hours in February (not a leap year).
5. Product of a baker's dozen and 325.
7. Last leap year in the 20th century.
9. Difference between 10^5 and 72^2 .
11. Area of a rectangle with a length of 62m and a breadth of 20m.
13. Perimeter of a garden with a length of 175m and a breadth of 75m.
15. $176 \times 0,125$
18. Two gross.
20. Number of days in 1 008 hours.

A STAR WITH NUMBERS

Find the value of the letters by calculating the answer to each of the eight questions.

1. Find the sum, if the addends are: 13^2 ; $\sqrt{441}$; 3 dozen; 2^{nd} composite number. (T)
2. Find the quotient if $4\frac{1}{4}$ score is the divisor and $[(2 \times 10^3)+(4 \times 10^1)]$ is the dividend. (I)
3. Find the product if the multiplicand is the 11^{th} prime number and the multiplier is $(\frac{1}{6}$ of an hour , in minutes) (B)
4. Find the difference if the minuend is the total number of degrees in 2 quadrilaterals and the subtrahend is the number of degrees in a revolution + 76° (M)
5. Find $(\frac{3}{4} - \frac{1}{6} + \frac{1}{4})$ of (the size of one angle in an equilateral triangle). (A)
6. $(3 \text{ gross} + \sqrt{7056}) \div$ the 1^{st} prime number. (R)
7. $(44 - 6,63) \div [(1 \times 10^0) + (1 \times 10^{\frac{1}{100}})]$ (E)
8. (Number of days in 81 weeks) \div the 4^{th} composite number. (A)



FOLLOWING FIBONACCI

Once you have completed all the questions in this task (correct order of operations is vital), rearrange your answers to create a Fibonacci sequence of 20 numbers, starting from 1.

1. A dozen + (a baker's dozen x the 7th prime number).
2. $9^4 + \frac{1}{4}$ of 816
3. Roman numeral LIV $\div \sqrt{2\ 916}$
4. (Total no. of degrees in a triangle, a kite, a right angle) - $\frac{1}{9}$ of a straight angle.
5. The 5th number in a Fibonacci sequence (starting from 1), multiplied by (12 - 1).
6. $\sqrt{\text{No. of seconds in an hour}} \div 3$ decades.
7. Find $\frac{3}{4}$ of $(13^2 + 23)$
8. Total no. of sides on: 5 triangles, 4 pentagons, 2 octagons, 2 nonagons, 2 decagons.
9. 2 millennia $\div 2\frac{1}{2}$ centuries.
10. Calculate: $4,5 + (2\frac{3}{4} \times 6)$
11. If one angle on a straight angle = 146° , find the size of the supplementary angle.
12. No. of degrees in 3 revolutions minus the 3rd multiple of 31.
13. A great gross minus the only prime number between 127 and 137.
14. $[(9 \times 1) + (3 \times 10) + (6 \times 100) + (2 \times 1000)] \div$ no. of months with 31 days.
15. If the minuend is 117 and the difference is 104, find the subtrahend.
16. Find 20% of $\frac{1}{4}$ of a century.
17. Decrease a baker's dozen by the number of faces on a dodecahedron.
18. Find the perimeter of a rectangle with length of 1 932m and breadth of 158,5m.
19. Calculate: $2^3 \times (16 \text{ score} + 2^{\text{nd}} \text{ prime number})$
20. Let the 1st natural number be the numerator and the 2nd prime number the denominator. Now find the reciprocal value of this fraction.

DISCOVERING THE UNKNOWN

In Maths we are always looking for the solution to a problem i.e. we are looking for a particular number that is unknown. In algebra this “unknown” is represented by any letter of the alphabet, usually x or y . Get used to using these “unknowns”, or “variables” as they are better known.

1. $12 + y = 21$

$\therefore y = \underline{\hspace{2cm}}$

2. $t - 14 = 104$

$\therefore t = \underline{\hspace{2cm}}$

3. $s + 13 = 28$

$\therefore s = \underline{\hspace{2cm}}$

4. $z - 13 = 40$

$\therefore z = \underline{\hspace{2cm}}$

5. $3x = 15$

$\therefore x = \underline{\hspace{2cm}}$

6. $4p = 20$

$\therefore p = \underline{\hspace{2cm}}$

7. $m \div 2 = 8$

$\therefore m = \underline{\hspace{2cm}}$

8. $y \div 8 = 48$

$\therefore y = \underline{\hspace{2cm}}$

9. $2k + 3k = 35$

$\therefore 5k = 35$

$\therefore k = \underline{\hspace{2cm}}$

10. $4r + 2r = 48$

$\therefore 6r = 48$

$\therefore r = \underline{\hspace{2cm}}$

11. $7d - 2d = 15$

$\therefore d = \underline{\hspace{2cm}}$

12. $10s - 3s = 14$

$\therefore s = \underline{\hspace{2cm}}$

13. $4x + 3 = 11$

$\therefore x = \underline{\hspace{2cm}}$

14. $2w - 3 = 17$

$\therefore w = \underline{\hspace{2cm}}$

15. $4g + 7 = g + 10$

$\therefore g = \underline{\hspace{2cm}}$

16. $3z + 4 = z + 12$

$\therefore z = \underline{\hspace{2cm}}$

17. $3w - 2 - w = 16$

$\therefore w = \underline{\hspace{2cm}}$

18. $14 + t = 24 - t$

$\therefore t = \underline{\hspace{2cm}}$

19. $5 \times 3 - 7 = 4y$

$\therefore \underline{\hspace{2cm}} = y$

20. $30 \div 5 + 8 = 2h$

$\therefore \underline{\hspace{2cm}} = h$

Now solve the following using a variable:

1. A bus pulls up at a bus stop with a certain number of people on board. Five people get off and 10 people get on. At the next stop 8 people get off and 4 get on. At the last stop 3 get off. If there are still 13 people on the bus, how many were on the bus to begin with?
2. Susan has some money in her purse. On her birthday her father gives her R200, her mother gives R150 and her grandmother gives her R100. She spends R12 at the tuck-shop, she buys 2 CD's for R99 each and she pays her brother back the R25 that she owes him. If she now has R325 left in her purse, how much money was in her purse to begin with?

DOUBLE TROUBLE

In this task the correct order of operations is vital. First work out the answers to the questions on the next page, then write each answer in its correct box on the table below. Accurate calculations will give you a result of **26** for both rows and columns.

a.		b.		c.		d.		e.		
10	+		÷		X		+		=	
+		÷		X		X		X		-
f.		g.		h.		i.		j.		
	X		÷		-		X		=	
-		X		÷		-		+		-
k.		l.		m.		n.		o.		
	-		X		-		-		=	
÷		÷		+		+		-		+
p.		q.		r.		s.		t.		
	÷		X		-		-		=	
+		-		+		-		-		+
u.		v.		w.		x.		y.		
	+		X		-		+		=	
=		=		=		=		=		=
	+		-		+		+		=	26



DAWSAN'S
Maths
EXPRESS

S. Edwards & D. Williams

Answers

1. FIGURING UPS AND DOWNS

¹ 1	² 4		³ 2	8	⁴ 9		⁵ 4	⁶ 9
⁷ 7	2	7	7		⁸ 3	3	2	8
	8		⁹ 5	¹⁰ 5	0		5	
¹¹ 3	4	¹² 3		9		¹³ 3	8	¹⁴ 3
5		¹⁵ 3	0	9	7	6		1
¹⁶ 7	¹⁷ 1	4		7		¹⁸ 4	¹⁹ 3	0
	0		²⁰ 2	6	²¹ 1		3	
²² 2	2	5	4		²³ 7	5	5	²⁴ 2
²⁵ 1	9		²⁶ 5	4	6		²⁷ 4	6

2. EQUATIONS

i) $X = W + 2$
 $7 = 5 + 2$

$T = R^2$ and $V = S^2$
 $9 = 3^2$ and $4 = 2^2$

$P = S \times V$
 $8 = 2 \times 4$

ii) $I \times K = K$
 $1 \times 9 = 9$
 K is not 5

$M + P = M \times M$
 $3 + 6 = 3 \times 3$
 K + O is one less than J + N
 $9 + 5 = (8 + 7) - 1$

$H \times H = L$
 $2 \times 2 = 4$
 $J > N$
 $8 > 7$

3. OPERATING NUMBERS

1. $A = 2$
 $B = 0$
 $C = 9$

2. $A = 2$
 $B = 4$
 $C = 1$
 $D = 6$
 $E = 3$

3. $A = 8$
 $B = 0$
 $C = 3$
 $D = 5$

4. SUM STICKLERS

1. Spiders 8 legs : Ants 6 legs $\therefore 8 : 6$ $\therefore \frac{8}{14} : \frac{6}{14}$ $\therefore \frac{8}{14}$ of 168 : $\frac{6}{14}$ of 168

$\therefore 96$ Spiders' legs : 72 Ants' legs $\therefore 96 \div 8$: $72 \div 6$ $\therefore \underline{12 : 12}$ \rightarrow

2. $V + F - 2 = E$ $\therefore 12 + 20 - 2 = \underline{30 \text{ edges}}$ \rightarrow

3. $(53 - 1) \div 2 = 26$ (The lower number) $\therefore \underline{26 \text{ and } 27}$ \rightarrow ($729 - 676 = 53$)

4. $7 + 8 = 15$ and $17 + 8 = 25$ $\therefore \frac{15}{25} = \frac{3}{5}$ $\underline{\text{The answer is therefore } 8}$ \rightarrow

5. Take R100 as the price of the article. With 20% discount the article is sold for R80. Now to sell for R100, increase by R20. $\frac{20}{80} \times \frac{100}{1} = \underline{25\%}$ \rightarrow

6. $23 - 1 - 1 = 11 \longrightarrow 11 - 1 - 5 = 5 \quad \therefore \underline{\text{Started with 23}} \longrightarrow$

7. Look at multiples of 7. (7; 14; 21; 28; 35; 42; 56; 63; 70; 77; 84; 91; ...)

a) It must be an odd number because 2 divided into an odd number leaves 1.

b) It would have to be a units digit of 1 or 6 (but 6 is even) because multiples of 5 end with a zero or 5.

$\therefore \underline{\text{The answer is 91}} \longrightarrow$

5. SUMMING- UP

	2	23	25	14	21	
5	13	31	6	22	5	6
11	2	17	33	11	14	17
27	21	4	12	27	13	21
24	15	23	1	14	24	1
2	26	2	25	3	21	26
	13	4	33	22	13	

6. PLACE YOUR NUMBERS

1	8	7	6	5	4	2	3	9
6	3	2	9	7	1	8	4	5
4	9	5	3	2	8	1	7	6
7	5	1	2	6	9	3	8	4
9	2	4	1	8	3	5	6	7
3	6	8	7	4	5	9	2	1
2	1	9	4	3	7	6	5	8
8	4	6	5	9	2	7	1	3
5	7	3	8	1	6	4	9	2

7	2	6	3	8	1	9	5	4
8	5	1	6	9	4	3	7	2
4	3	9	5	7	2	1	6	8
9	6	8	1	4	7	5	2	3
3	7	4	2	5	8	6	1	9
2	1	5	9	6	3	8	4	7
1	9	7	4	3	5	2	8	6
5	4	3	8	2	6	7	9	1
6	8	2	7	1	9	4	3	5

7	9	4	2	5	8	1	6	3
8	2	1	9	3	6	4	9	5
5	3	6	4	7	1	2	8	9
2	6	8	5	4	3	9	1	7
3	1	5	6	9	7	8	2	4
4	7	9	8	1	2	3	5	6
9	8	7	1	6	4	5	3	2
6	4	2	3	8	5	7	9	1
1	5	3	7	2	9	6	4	8

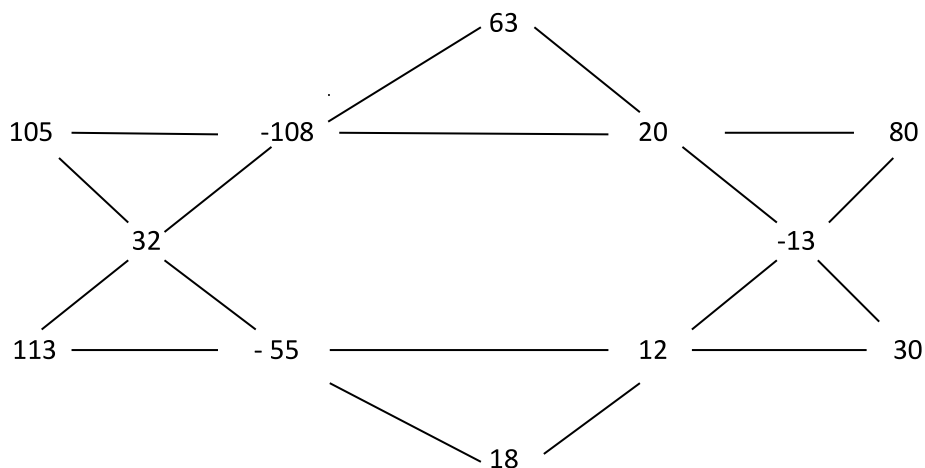
7. CRYPTIC CROSSWORD

1. P	R	O	2. T	R	A	C	T	3. O	R		4. S	U	5. M
A			W					N		6. M			I
L		7. F	O	U	8. R			C		I			N
9. I	L				10. A	C	R	E		N			I
N					T					U		11. A	M
12. D	O	U	13. B	L	E	14. C	R	15. O	S	S			U
R			A			M		V		S		16. P	M
O			17. S	U	18. M			E		I		I	
19. M	I	20. L	E		21. A	V	E	R	A	G	E		22. U
I		C			S					N			N
23. C	24. O	M	25. P	O	S	I	26. T	E			T	R	I
	N		I				E				R		T
28. M	E	A	N				T		29. V		U		
I			T		30. B	R	A	C	K	E	T	S	

8. FUN FOLLOW-ON

- $4 \times 5 = 20$
- $36 + 20 = 56$
- $56 \div 4 = 14$
- $14 + 1316 = 1330$
- $1330 \div 5 = 266$
- $266 - (3 + 16 + 12 + 2 + 20 + 1) = 266 - 54 = 212$
- $212 \div 4 = 53$
- MILLENIUM and PARRALLELOGRAM $\therefore 53 - 2 = 51$
- $51 - (40 \times 2 \div 2 - 29 = 11) = 22$
- $22 + 30 + 400 + 2000 + 70 = 2522$
- $2522 + (25\% \text{ of } 316) = 2522 + 79 = 2601$ $\sqrt{2601} = 51$
- $51 \times 13 + 3 = 666$

9. NUMBER STAR

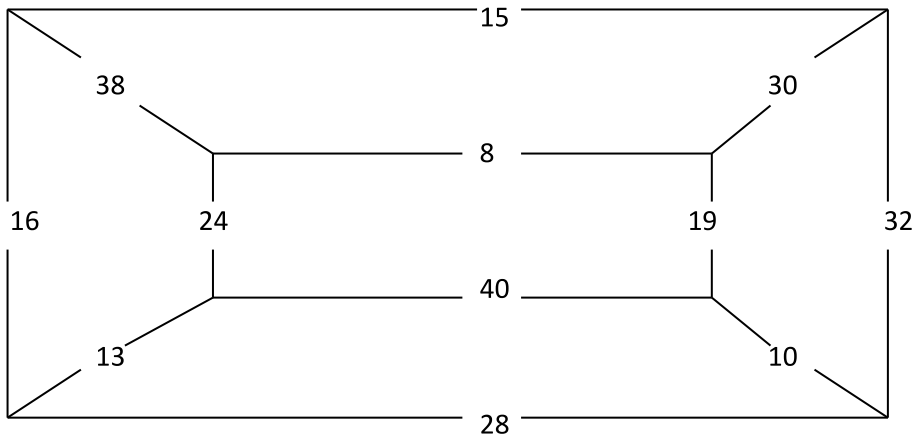


10. MAGIC SQUARES

1.

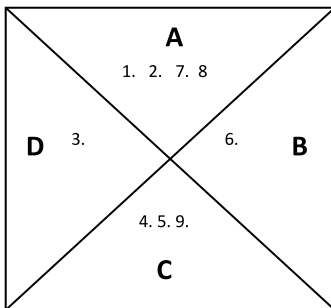
522	347	162	828
194	796	554	315
764	98	411	586
379	618	732	130

2.

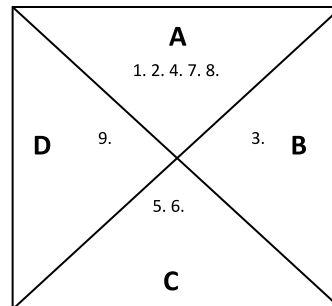


11. DEDUCE- IT

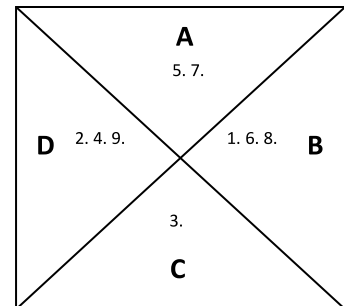
1.



2.



3.



12. TAG-ONS

1.

K	N	O	T	I	C	K	I	T	E	V	E	N	I	N	E
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

2.

I	N	A	D	D	I	T	I	O	N	O	U	G	H	T
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

3.

T	A	K	E	A	W	A	Y	A	R	D	A	T	A
---	---	---	---	---	---	---	---	---	---	---	---	---	---

4.

V	U	L	G	A	R	I	G	H	T	A	N	G	L	E
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

5.

P	Y	R	A	M	I	D	E	C	I	B	E	L	I	X
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

6.

P	I	N	T	E	R	E	S	T	W	O	D	D
---	---	---	---	---	---	---	---	---	---	---	---	---

7.

M	E	A	N	E	G	A	T	I	V	E	L	E	V	E	N
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

8.

F	O	O	T	O	P	L	A	N	E	Q	U	A	L
---	---	---	---	---	---	---	---	---	---	---	---	---	---

9.

M	I	N	U	T	E	I	G	H	T	H	R	E	E
---	---	---	---	---	---	---	---	---	---	---	---	---	---

10.

F	I	F	T	H	O	U	R	A	Y	E	A	R
---	---	---	---	---	---	---	---	---	---	---	---	---

13. NUMBER LOGIC

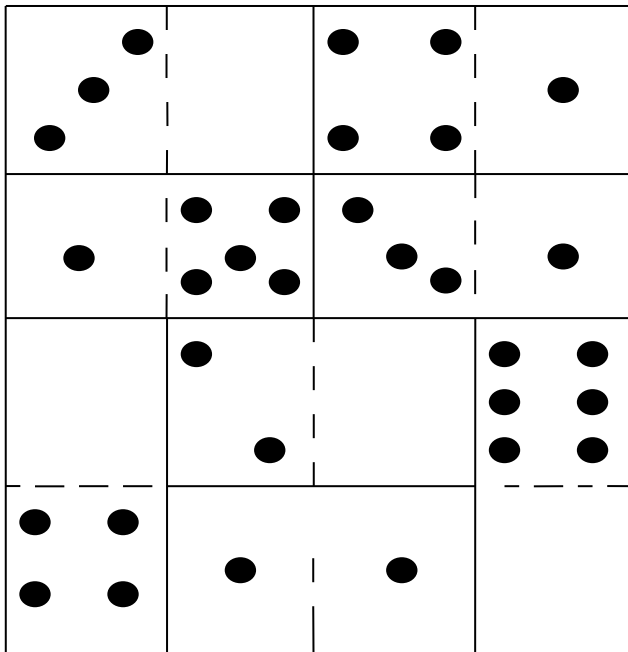
1.

G	E	A
C	I	D
H	B	F

2.

C	I	F
E	H	D
G	B	A

14. DOTTY DOMINOES



15. CANCELLATIONS

- | | |
|-----------------------------------------|--------------------------------------|
| 1. Straight; acute; reflex; obtuse | 2. Scalene; isosceles; equilateral |
| 3. Numerator; denominator | 4. Multiplier; multiplicand; product |
| 5. Trapezium; square; rhombus; kite | 6. Common; vulgar; decimal |
| 7. Pentagon; hexagon; nonagon; triangle | 8. Trigonometry; algebra |
| 9. Season; decade; fortnight; century | 10. Pie; frequency; bar; histogram |
| 11. Pint; quart; gill; gallon | 12. Pyramid; cube; prism |
| 13. Pound; ton; kilogram; gram | 14. Septet; duet; trio |
| 15. Semi; tetra; quint; octo | 16. Fahrenheit; celcius |
| 17. Prime; natural; counting | |

ENGLISH PROVERB: MORE HASTE LESS SPEED

16. TRIANGLE NUMBERS

2	7	6	4	7	1	6	8	3	4	5
T	I	M	E	I	S	M	O	N	E	Y

19. NUMBERS AND LETTERS

- | | | |
|----------------------------------------|------------------------------------|------------------------------------|
| 1. 180 degrees in a triangle | 2. 4 sides on a square | 3. 8 sides on an octagon |
| 4. 20 in a score. | 5. 366 days in a leap year | 6. 60 seconds in a minute |
| 7. 1000 years in a millennium | 8. 3 sides on a triangle | 9. 14 days in a fortnight |
| 10. 10 years in a decade | 11. 144 in a gross | 12. 500 Roman numeral D |
| 13. 180 degrees in a straight angle | 14. 10 sides on a decagon | 15. 13 in a baker's dozen |
| 16. 100 years in a century | 17. 12 dozen in a gross | 18. 9 sides on a nonagon |
| 19. 2 only even prime number | 20. 6 faces on a cube | 21. 0 first counting number |
| 22. 1 first natural number | 23. 360 degrees in a quadrilateral | 24. 24 hours in a day |
| 25. 3,14 average value of pi | 26. 7 days in a week | 27. 29 days in Feb. in a leap year |
| 28. 1 728 in a great gross | 29. 100 cents in a Rand | 30. 50 Roman numeral L |
| 31. 90 degrees in a right angle | 32. 12 gross in a great gross | 33. 1 000 millilitres in a litre |
| 34. 2 in a brace | 35. 360 degrees in a revolution | 36. 5 sides on a pentagon |
| 37. $365\frac{1}{4}$ days in a year | 38. 6 sides on a hexagon | |
| 39. 42,2 normal distance of a marathon | 40. $\frac{22}{7}$ value of pi | |
-

20. WHAT IS THAT NUMBER?

- | | | |
|---------------|--------------|--------------|
| 1. $x = 56$ | 2. $x = 64$ | 3. $x = 10$ |
| 4. $x = 12$ | 5. $x = 1$ | 6. $x = 45$ |
| 7. $x = 60$ | 8. $x = 8,8$ | 9. $x = 192$ |
| 10. $x = 34$ | 11. $x = 14$ | 12. $x = 13$ |
| 13. $x = 441$ | 14. $x = 23$ | 15. $x = 96$ |
-

21. PROBLEMATIC PROGRESSIONS

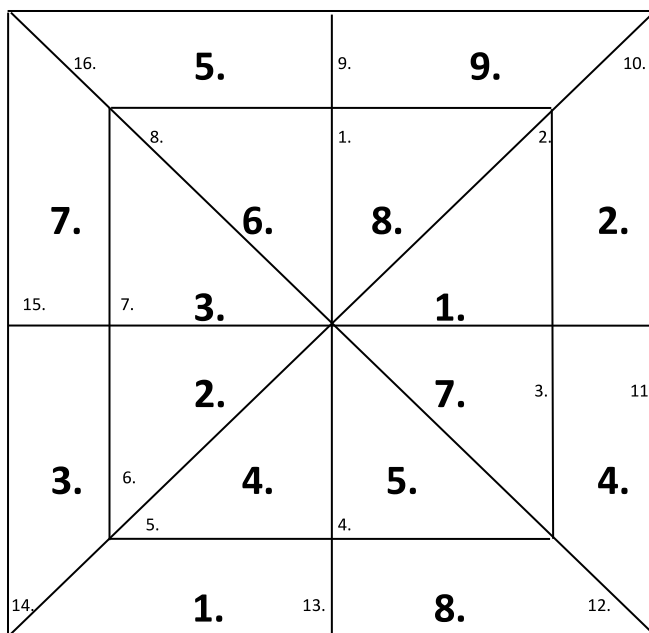
- (Add 2; add 3; add 2; add 3; ...) 22; 22
- (Every alternate add 1; add 2; add 3; add 4; ...) 14; 25
- (Consecutive square numbers) 49; 64
- (Adding consecutive composite numbers) 50; 64
- (Adding consecutive prime numbers) 42; 59
- ($1^1; 2^2; 3^3; 4^4; 5^5 \dots$) 46 656; 823 543
- (Fibonacci Sequence) 34; 55
- (Alternatively adding 2 and adding 1) 10; 6
- (Divide by 1; by 2; by 3; by 4; ...) $\frac{2}{15}$; $\frac{1}{45}$
- (Adding consecutive square numbers 1; 4; 9; 16; ...) 95; 144
- (Keep subtracting $7\frac{3}{4}$) -9; $-16\frac{3}{4}$
- (Alternately subtracting/ adding consecutive numbers) 8; 29

13. (Keep multiplying by $\frac{1}{6}$ OR dividing by 6) $\frac{1}{3888}$; $\frac{1}{23328}$
14. (Subtract $\frac{1}{2}$; 1; $1\frac{1}{2}$; 2; $2\frac{1}{2}$; 3; ...) 92,5; 89,5
15. (Convert to fractions $\frac{1}{2}$; $\frac{3}{4}$; $\frac{5}{6}$; $\frac{7}{8}$; $\frac{9}{10}$; $\frac{11}{12}$ ) 0,9166; 0,9285
16. (Square roots) 100; 81
17. (Divide by and add 1) $8\frac{1}{8}$; $5\frac{1}{16}$
18. (Every alternate number multiplied by 2 / 3) 16; 81
19. (Add 3; add 6; add 12; add 24; add 48; ...) 95; 191
20. (Subtracting consecutive odd numbers) 0; -2

22. CODED ALPHABET

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	Y	Z
13	15	18	22	8	24	2	17	6	11	21	19	10	12	1	25	23	20	3	16	4	14	5	9	7

23. NUMBER PICTURE



24. MORE TO DEDUCE

- 1.
- 2.
- 3.

25. KNOCK-OUT

- | | | |
|------------------------|--------------------|-----------------------|
| 1. 17; 19; 23 | 2. 12; 36; 52 | 3. 10; 20; 30; 40; 50 |
| 4. 1; 16; 2; 8; 4 | 5. 43; 44; 45 | 6. 9; 25; 49 |
| 7. 21 | 8. 15; 11; 7; 6; 5 | 9. 13; 26; 39; 52 |
| 10. 22; 33 | 11. 31; 55 | 12. 53; 54 |
| 13. 3; 51 | 14. 18; 34; 42 | 15. 27; 28; 29 |
| 16. 16; 24; 32; 48; 56 | 17. 35; 46; 38 | 18. 37; 47 |

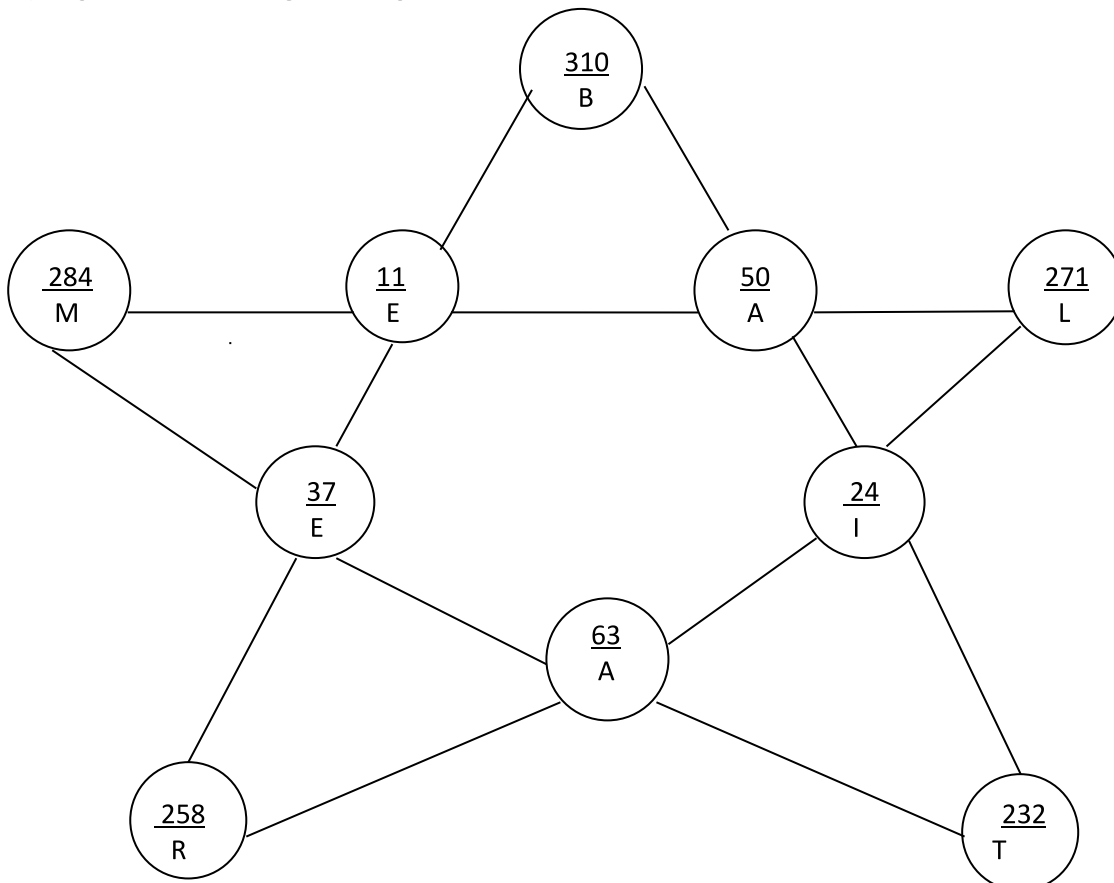
REMAINING DIGITS: 14 and 41

∴ 1441 or 4114

26. CROSS NUMBER

1. 3	7	2. 5			3. 1	8	4. 6	0	5. 4
6		6. 2	1	7. 1	2	8	7		2
8. 2	9. 9			10. 9	2	11. 1	2		2
12. 4	4	13. 5		14. 9	5	2		15. 2	5
	16. 8	0	1	6		17. 4	18. 2	2	
	19. 1	0			20. 4	0	8		
21. 1	6		22. 1	1	2		23. 8	2	0

27. A STAR WITH NUMBERS



28. FOLLOWING FIBONACCI

- | | | | | |
|--------|----------|-----------|-----------|--------|
| 1. 233 | 2. 6 765 | 3. 1 | 4. 610 | 5. 55 |
| 6. 2 | 7. 144 | 8. 89 | 9. 8 | 10. 21 |
| 11. 34 | 12. 987 | 13. 1597 | 14. 377 | 15. 13 |
| 16. 5 | 17. 1 | 18. 4 181 | 19. 2 584 | 20. 3 |

1; 1; 2; 3; 5; 8; 13; 21; 34; 55; 89; 144; 233; 377; 610; 987; 1 597; 2 584; 4 181; 6 765

29. DISCOVERING THE UNKNOWN

- | | | | |
|-------------|--------------|-------------|--------------|
| 1. $y = 9$ | 2. $t = 118$ | 3. $s = 15$ | 4. $z = 53$ |
| 5. $x = 5$ | 6. $p = 5$ | 7. $m = 16$ | 8. $Y = 384$ |
| 9. $k = 7$ | 10. $r = 8$ | 11. $d = 3$ | 12. $s = 2$ |
| 13. $x = 2$ | 14. $w = 10$ | 15. $g = 1$ | 16. $z = 4$ |
| 17. $w = 9$ | 18. $t = 5$ | 19. $y = 2$ | 20. $h = 7$ |

1. $x - 5 + 10 - 8 + 4 - 3 = 13 \quad \therefore x = 15$

2. $x + R200 + R150 + R100 - R12 - (2 \times R99) - R25 = R325 \quad \therefore x = R110$

30. DOUBLE TROUBLE

a.		b.		c.		d.		e.		
10	+	24	÷	4	x	3	+	2	=	30
+				x		x		x		-
f.		g.		h.		i.		j.		
12	x	12	÷	4	-	7	x	3	=	15
-		x		÷		-		+		-
k.		l.		m.		n.		o.		
100	-	36	x	2	-	14	-	10	=	4
÷		÷		+		+		-		+
p.		q.		r.		s.		t.		
20	÷	4	x	3	-	9	-	2	=	4
+		-		+		-		-		+
u.		v.		w.		x.		y.		
2	+	10	x	1	-	10	+	9	=	11
=		=		=		=		=		=
19	+	8	-	12	+	6	+	5	=	26



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