



family functions. It will be  
a privilege if, you could  
personally question the girl  
before making up your  
mind.

I await your further  
advice in the matter. Please  
overlook the trouble,

yours sincerely  
Auntie

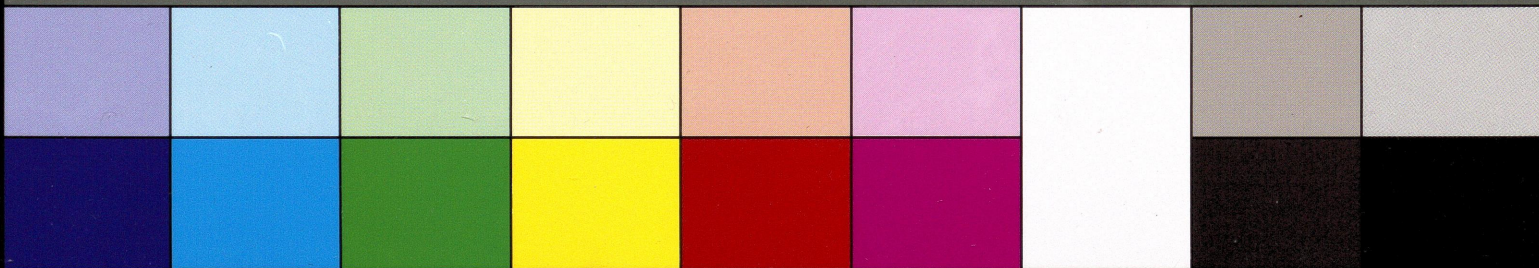
Inches 1 2 3 4 5 6 7 8

Centimetres

**TIFFEN** Color Control Patches

© The Tiffen Company, 2007

Blue Cyan Green Yellow Red Magenta White 3/Color Black





TE  
RES-  
ERY

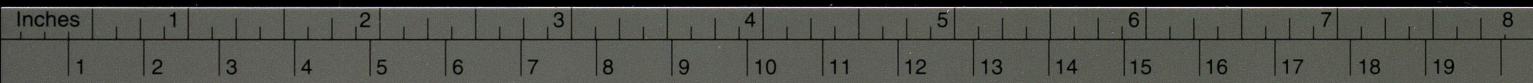
b.

WEIGHT  
1 MAY  
11 1969  
BANGALORE GP TRMS

CORREO  
ADDRESS  
QUICK DELIV



Sri. B. S. Madhava Rao.  
No. 4 Kankaballi Road  
Basavanagudi  
Bangalore - 4.

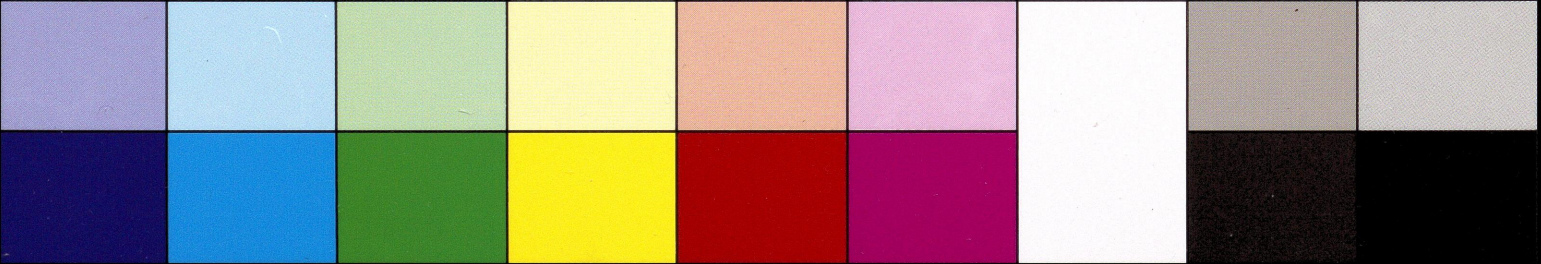


Centimetres

**TIFFEN** Color Control Patches

© The Tiffen Company, 2007

Blue      Cyan      Green      Yellow      Red      Magenta      White      3/Color      Black





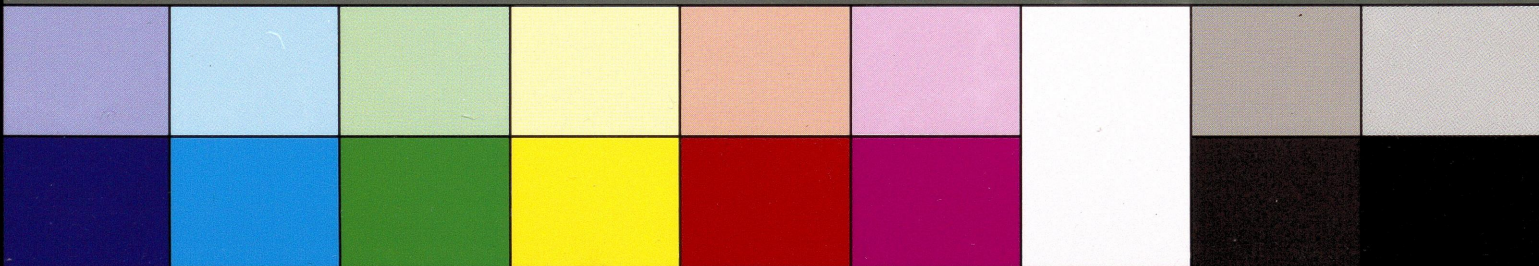
Inches 1 2 3 4 5 6 7 8

Centimetres

**TIFFEN** Color Control Patches

© The Tiffen Company, 2007

Blue Cyan Green Yellow Red Magenta White 3/Color Black



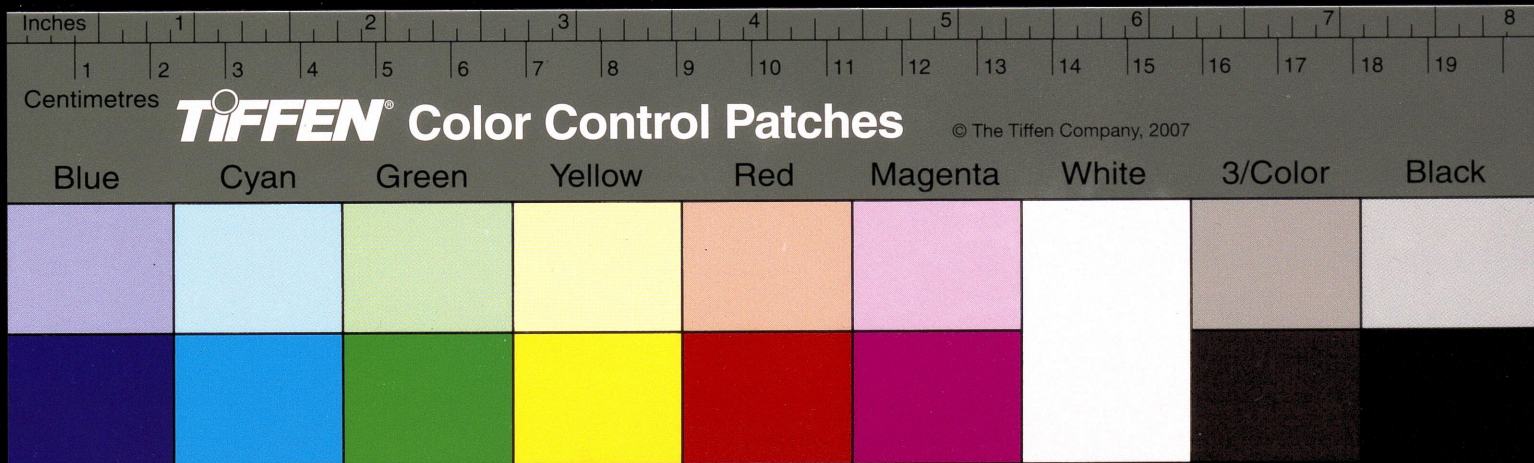
29/4/69

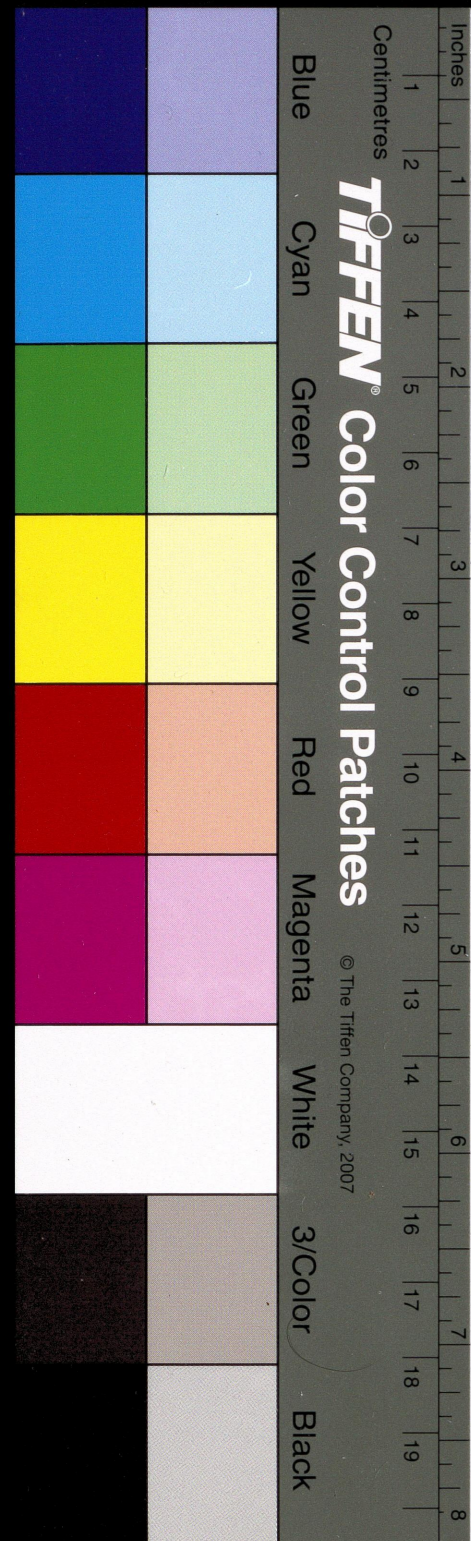
My dear Anantharamiah,

Your letter dated the 21<sup>st</sup> inst. with the enclosure. I regret to say that the answers given by the candidate are all wrong with two trivial exceptions, and I see no evidence of interest or talent in mathematics. There have been ~~many~~<sup>other</sup> examples of young people ~~showing~~ having a knack for the trivial gymnastics of rapid multiplication addition and multiplication etc, which is due to a sort of a built in memory of the computer type. Such people have invariably shown no real mathematical ability of a high order. I see no point in pursuing the matter further.

With best regards,

Yours sincerely  
Bsm





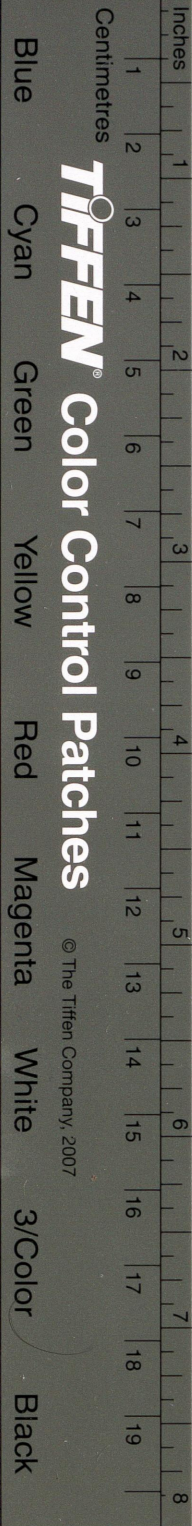
Question.	Answer.	Time taken.	Method adopted.
1. Find the smallest number of four digits which is not factorisable.	1109 X	10 seconds.	P.T.O. Since this figure was told first, this has been taken even though there are other nos. lesser than this.
2. Find two consecutive non-factorisable numbers between 800 & 900.	821, 823 ✓ 881 & 883 ✓	1 Minute.	P.T.O.
3. Express 1620 as the sum of two non-factorisable numbers.	799 & 821 X	7 seconds.	Same as sl. no. 2.
4. Find the last digit in (i) $4537^5$ and (ii) $4539^5$ .	7 & 9 ✓	10 "	Mathematical commonsense
5. In how many ways can 17 be made by adding four of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9? (without repetitions).	2+3+4+8 X	10 "	The problem not understood properly. After explanation, she has given other combinations without repetitions. But they are all omitted here purposely.
6. Find positive integers x and y such that (i) $13x+17y=3000$ and (ii) $3x^2-17y^2=7$ .	X	—	Unable to solve as she doesn't know much of Algebra.
7. Express $111/140$ as the sum of three proper fractions.	$35/140; 37/140$ & $39/140$ X	15 seconds.	P.T.O.
8. Find the number of integers less than 1024 which have no common factors with it.	$821+191+1171 = 1024$ X	2 minutes.	P.T.O.
9. Find the smallest number with 24 divisors.	5040 X	10 seconds.	$1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 = 5040$ No. 7 is the only peculiar no. from 1-10. More than 24 divisors can be got from the multiples of these base nos.

1. Even nos. and any no. ending with 0 and 5 are factorisable. The sum total of the figures of any given no. which can be divided by 9 has 9 factors. In the no. 1109, the last figure is 9 and in between that, the figure 0 has no value in her opinion for purposes of factorisation to find out non factorisable nos. It is not possible to factorise if the given no. is split into 2 parts [Here 11 & 9] factorisable and non factorisable. Because 11 is non factorisable whereas 9 is factorisable. Further, if the figure 9 is subtracted from 110 we get 101 which is not factorisable and hence 1109 has no factors.

2. The same reasoning as above holds good here also. i.e. figure 8 is factorisable. 83 is not factorisable. Therefore - the whole figure is not factorisable. She confirms that there are more combinations between 800-900. But she has cited 2 sets of examples which struck to her first. She can give such combinations within 10000.

7. 111 is divisible by 3 and as such 37 is taken as the average. Adding 2 more 39 is taken and deducting 2 from 37, 35 is taken. There are other combinations i.e. 29, 37 & 45 & 36, 37 & 38 etc.

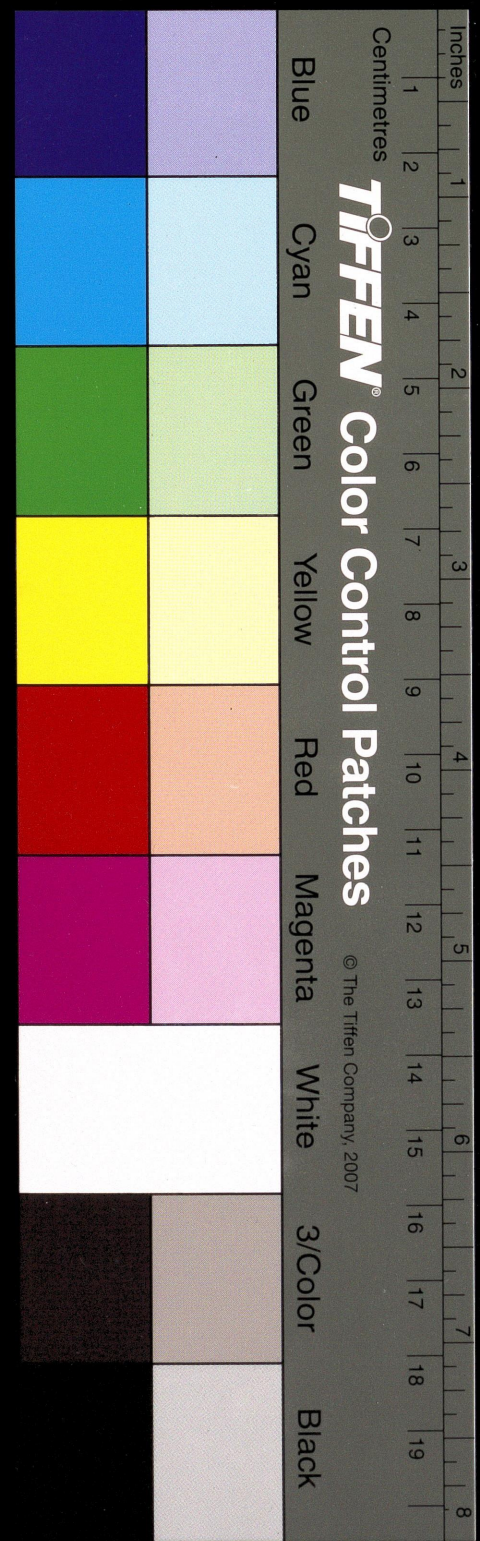
8. Here she understood the problem differently and has offered the 4 non factorisable figures, the total of which comes to 1024. She can give more of non factorisable nos. within 1024.



Question.	Answer.	Time taken.	Method adopted.
10. Find the number of divisors of 2,000 and their sum.	17 divisors Sum total 2785	25 seconds.	Mathematical common-sense plus quick addition of divisors.
11. Express 55 as a difference of two squares in two ways.	$27^2 & 28^2$	10 seconds.	Any given difference should be divided by 2 ignoring the remainder if any and add the required no. to make up the given difference.
12. Find four consecutive integers divisible by 5,7,9,11 respectively.	3465; 6930; 10395 & 13860	6 minutes.	

→ To take the common factor of the given nos. and take the multiples of common factor.

N. O. The methods adopted may or may not be correct from scientific point of view as they are all done by a student taking "Arts" as her subjects. Since the mathematical terms of the questionnaire is understood properly she can give the answers instantaneously.



- (1) Find the smallest number of four digits which is not factorisable (Ans: 1009).
- (2) Find two consecutive non-factorisable numbers between 800 and 900  
(Ans: 881 & 883)
- (3) Express 1620 as the sum of two non-factorisable numbers  
(Ans: 691 + 929 or 757 + 863)
- (4) Find the last digit in (i)  $4537^5$ , and (ii)  $4539^5$ . (Ans: 7, 9)
- (5) In how many ways can 17 be made up by adding four of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9? (without repetitions)

[Ans: 9 viz. 1+2+5+9, 1+2+6+8, 2+3+4+8, 2+3+5+7  
~~2+3+6+7~~, 1+3+5+8, 1+3+6+7, 1+4+5+7  
 1+3+4+9,  
 and 2+4+5+6]

- (6) Find positive integers  $x$  and  $y$  such that (i)  $13x + 17y = 3000$ , and  
 (ii)  $3x^2 - 17y^2 = 7$  [Ans: (i)  $x = 15, y = 165$ ; (ii)  $x = 5, y = 2$  or  $x = 12, y = 5$ .  
 or  $x = 219, y = 9$ ]

- (7) Express  $\frac{111}{140}$  as the sum of three proper fractions [Ans:  $\frac{111}{140} = \frac{1}{4} + \frac{2}{5} + \frac{1}{7}$ ]

- (8) Find the number of integers less than 1024 which have no common factor with it

[1024 =  $2^9$  and integers having a common factor with it are all the even numbers up to 1024 i.e. 2, 4, 6, 8, 10, . . . ., 1024. Hence the number required =  $\frac{1024}{2} = 512$ ]

- (9) Find the smallest number with 24 divisors

[24 =  $4 \times 3 \times 2$  and if  $N = 2^a 3^b 5^c$ ,  $(a+1)(b+1)(c+1) = 4 \cdot 3 \cdot 2$  i.e.  $a = 3, b = 2, c = 1$   
 and  $N = 2^3 \cdot 3^2 \cdot 5 = 360$ ]

- (10) Find the number of divisors of 2000, and their sum.

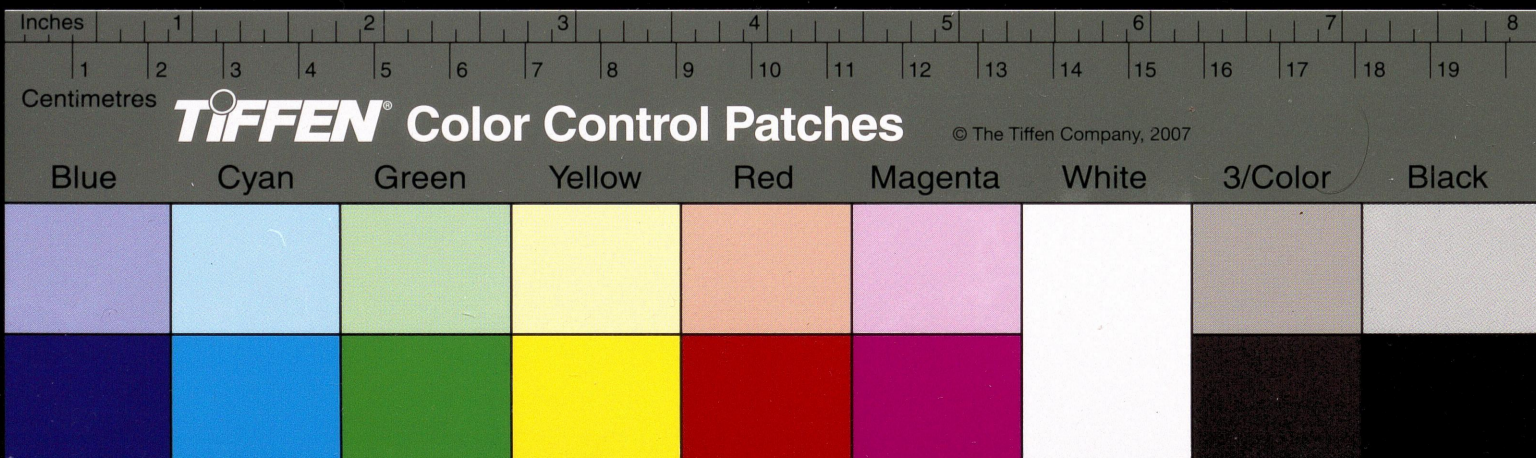
[Ans:  $2000 = 2^4 \cdot 5^3$ . Hence number of divisors =  $(4+1)(3+1) = 20$   
 their sum =  $\frac{2^5-1}{2-1} \cdot \frac{5^4-1}{5-1} = 31 \times 156 = 4836$ ]

- (11) Express 55 as a difference of two squares in two ways.

[Ans:  $\nexists 55 = a^2 - b^2, a - b = 5$  } or  $a - b = 1$   
 $a + b = 11$  }  $a + b = 55$   
 i.e.  $a = 8, b = 3$  or  $a = 28, b = 27$ ]

- (12) Find four consecutive numbers divisible by 5, 7, 9, 11 respectively

[P.T.O]



6 (i) The eqn can be written as  $13(12000 - x) = 17(y - 9000)$

$$\therefore x = 12000 - 17t, y = 9000 + 13t - 9000$$

and  $13t - 9000 > 0$  for  $t > \frac{9000}{13}$  i.e.  $t \geq 693$ , Also  $\frac{12000}{17} = 705\frac{15}{17}$

Taking  $t = 693$  gives ~~another~~ soln viz  $x = 217, y = 659$

"  $t = 705$  " another " viz  $x = 15, y = 165$

There are 11 more solns for  $t = 694, \dots, 704$ .

(ii) Here obviously  $x > y$ . Trying  $y = 1, 2, 3, 4, 5, \dots$

We find  $3x^2 = 17y^2 + 7$  gives for  $y = 2, 3x^2 = 75$  i.e.  $x^2 = 25$  or  $x = 5$

and for  $y = 5, 3x^2 = 432$  or  $x^2 = 144$  or  $x = 12$

i.e.  $(5, 2)$  and  $(12, 5)$  are solns

7. Writing  $\frac{111}{140} = \frac{a}{4} + \frac{b}{5} + \frac{c}{7}$  we have  $35a + 28b + 20c = 111$

All  $a, b, c$  cannot be  $\geq 2$ , and  $2$  of  $a, b, c$  cannot be  $\geq 2$ . Hence only  $a, b, c$

also  $a = 2$ , or  $c = 2$  is not possible & hence only case is  $a = 1, b = 2, c = 1$

12. Since there are four divisibility conditions, let the number be  $abcd$  & to find the smallest set of such four numbers we can take  $a = 1$ , divisibility by 5 requires  $d = 0$  or 5.

Taking  $d = 0$ , the nos. are  $1bc0, 1bc1, 1bc2, 1bc3$ . Divisibility of  $1bc3$  by 11

requires  $b + 3 - 1 - c = 11x$  or  $b - c + 2 = 11x$  & only  $x = 1$  is possible i.e.  $b - c = 9$

or  $b = 9, c = 0$  & then  $1902$  is not divisible by 9. Hence  $d \neq 0$ .

Thus taking  $d = 5$ , nos. are  $1bc5, 1bc6, 1bc7, 1bc8$ . Divisibility of the

last by 11 requires  $b + 8 - 1 - c = 11x$  or  $b - c + 7 = 11x$  only  $x = 1$  is possible

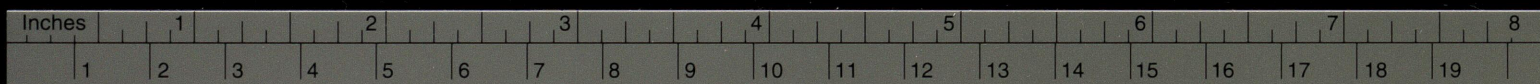
i.e.  $b - c = 4$ . Divisibility of  $1bc7$  by 9 requires  $b + c + 8 = 9y$  i.e.  $y = 1$  or 2

i.e.  $b + c = 1$  or  $b + c = 10$ .  $b - c = 4$  with  $b + c = 1$  does not give integral  $b$  &  $c$ . Hence

only possibility is  $b - c = 4, b + c = 10, b = 7, c = 3$  and  $1735$  with this choice

$1736$  also is divisible by 7. Hence the numbers are  $1735, 1736, 1737, 1738$ .

====



Centimetres

**TIFFEN** Color Control Patches

© The Tiffen Company, 2007

Blue

Cyan

Green

Yellow

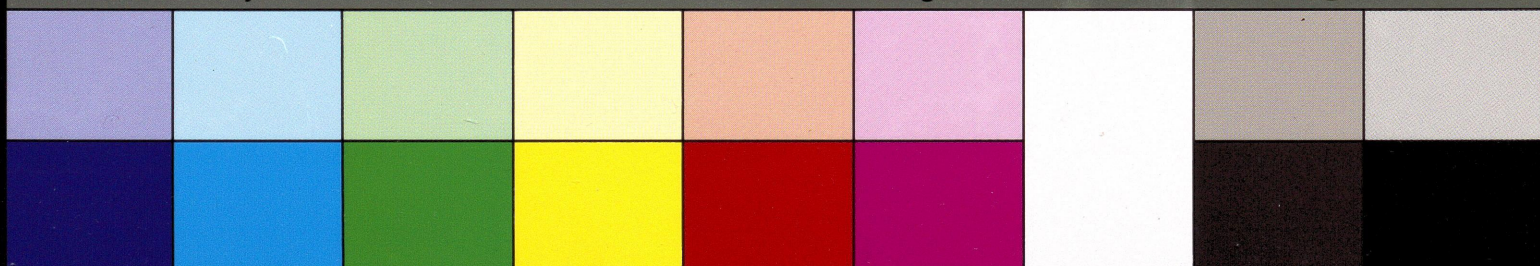
Red

Magenta

White

3/Color

Black



$$\frac{111}{140} \approx \frac{a}{4} + \frac{b}{5} + \frac{c}{7} = \frac{35a + 28b + 20c}{140}$$

$$35a + 28b + 20c = 111$$

$$a \neq 1 \text{ is } a = 1$$

$$28b + 20c = 76$$

$$7b + 5c = 19$$

$$b = 2, c = 1$$

40  
28  
35  
103

$$\frac{1738}{99} = \frac{153}{9} = 17$$

$$11x - 9y = 1; x = 5 + 9t$$

$$y = 6 + 11t$$

$$\frac{11}{9} = 1 + \frac{1}{4} + \frac{1}{2} + \frac{1}{4}$$

$$55 + 99t$$

$$54 + 99t$$

$$11x \equiv 1 \pmod{9}$$

$$11x \equiv 2 \pmod{7}$$

$$11x \equiv 3 \pmod{5}$$

$$x \equiv 0 \pmod{11}$$

$$x \equiv 1 \pmod{9}$$

$$x \equiv 2 \pmod{7}$$

$$x \equiv 3 \pmod{5}$$

$$12345671 = a_0 + a_1 \cdot 10^3 + a_2 \cdot 10^6$$

$$10000000 + 2345671$$

$$1000000 \cdot 10^8$$

$$10^7 + 2000000 + 345671$$

$$= 10^7 + 2 \cdot 10^6 + 3 \cdot 10^5 + 4 \cdot 10^4 + 5 \cdot 10^3 + 6 \cdot 10^2 + 7 \cdot 10 + 1$$

$$= 671 + 10^3(5 + 40 + 300) + 10^6(2 + 10)$$

$$= 671 + 345 \cdot 10^3 + 12 \cdot 10^6$$

$$16c5 \div 5$$

$$16c6 \div 7$$

$$16c7 \div 9$$

$$16c8 \div 11$$

$$1918x$$

$$1828x$$

$$1738x$$

$$1648x$$

$$1558x$$

$$1468x$$

$$1378x$$

$$1288x$$

$$1198x$$

$$abc0$$

$$abc1$$

$$abc2$$

$$abc3$$

$$bc1 - a = 7x$$

$$bc3 - a = 11y$$

$$11y - 7x = 2$$

$$y = 4 + 7t$$

$$x = 6 + 11t$$

$$1736 \div 7$$

$$1736 = 736 + 10^3$$

$$736 - 1 = 735 \text{ divisible by } 7$$

$$b + c + 8 = 9x$$

$$x = 1 \text{ or } 2$$

$$7 \mid 11(1) \quad abcd$$

$$4 \mid 7(1)$$

$$3 \mid 4(1)$$

$$4 \mid 7(1) \quad 1) \quad 3(3)$$

$$4 \mid 7(1) \quad 4(3)$$

$$6 + 3 + 10 + 10$$

$$\frac{11}{7} = 1 + \frac{1}{1} + \frac{1}{3} + \frac{1}{3}$$

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

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

$$b + c + 3 = 9x$$

$$1 + c - (b + 3) = 11y$$

$$c - b - 2 = 11y$$

$$2c + 1 = 9x + 11y$$

$$b + c = 3d$$

$$1407$$

$$1517$$

$$1737x$$

$$1847$$

$$1957$$

$$1153$$

$$1241 \div 7$$

$$1243 \text{ or } 1247$$

$$1242$$

$$1 + b + c + d + 2$$

$$b + c + d + 3$$

$$b + c + 3 = 9$$

$$b + c = 3x$$

$$x + 1 \div 9$$

$$b + c = 6$$

$$b + c = 6$$

$$c \mid 5 \mid 4 \mid 3 \mid 2 \mid 1 \mid 0$$

$$c \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6$$

$$c \mid 5 \mid 4 \mid 3 \mid 2 \mid 1 \mid 0$$

$$c \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6$$

$$c \mid 5 \mid 4 \mid 3 \mid 2 \mid 1 \mid 0$$

$$c \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6$$

$$c \mid 5 \mid 4 \mid 3 \mid 2 \mid 1 \mid 0$$

$$c \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6$$

$$c \mid 5 \mid 4 \mid 3 \mid 2 \mid 1 \mid 0$$

$$c \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6$$

$$c \mid 5 \mid 4 \mid 3 \mid 2 \mid 1 \mid 0$$

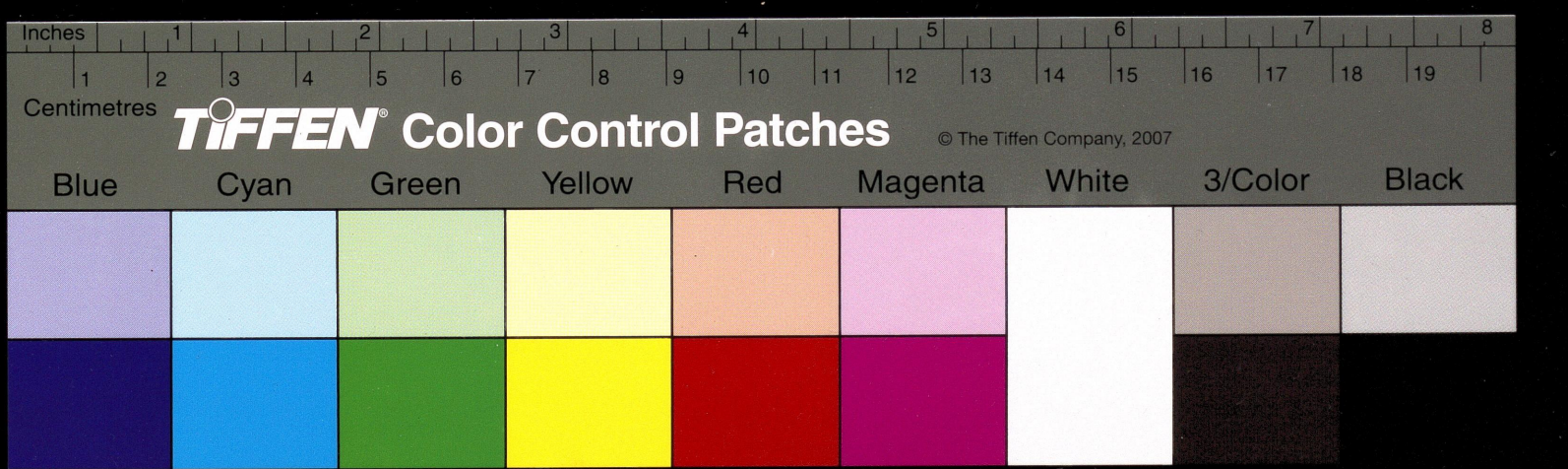
$$c \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6$$

$$c \mid 5 \mid 4 \mid 3 \mid 2 \mid 1 \mid 0$$

$$c \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6$$

$$c \mid 5 \mid 4 \mid 3 \mid 2 \mid 1 \mid 0$$

$$c \mid 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6$$



abcd

Take a=1, → 1bcd

a=0 or 5 → 1bcd or 1bc5

$$\frac{9000}{13} = 692$$

$$\frac{120}{117} = 30$$

9009

(i) 1bcd

$$1bc1 \div 7$$

$$1bc2 \div 9 \rightarrow b+c+3 \div 9 \rightarrow b+c+3 = 9x \text{ ie } x=1 \text{ or } 2$$

$$1bc3 \div 11 \rightarrow b+3-1-c \div 11 \rightarrow b-c+2 = 11y \text{ ie } y=1 \text{ only} \rightarrow b-c=9 \text{ ie } b=9, c=0, \text{ but } 1902 \neq 9$$

hence d ≠ 0

(ii) Hence 1bc5

$$1bc8 \div 11 \rightarrow b+8-c-1 = 11x \text{ ie } b-c = 11x-7 \text{ ie } x=1 \text{ alone is possible}$$

$$\rightarrow b-c=4 \text{ ie } \begin{array}{|c|c|c|c|c|c|c|} \hline b & 4 & 5 & 6 & 7 & 8 & 9 \\ \hline c & 0 & 1 & 2 & 3 & 4 & 5 \\ \hline \end{array}$$

- 9. These 1407x
- 1517x
- 1627x
- 1737 ✓
- 1847x
- 1957x

1737 alone is ÷ 9  
 Also 1736 " ÷ 7

Hence nos are 1735, 1736, 1737, 1738.

24

$$3 \times 9 = 27$$

(9) 
$$\begin{array}{r} 48 \times 99 \\ 432 \\ 4752 \\ \hline \end{array}$$

(9) 
$$\begin{array}{r} 432 \\ 432 \\ \hline 4752 \end{array}$$

30  
 7, 11, 13, 17, 19, 23, 29

5, 7, 11, 13, 17, 19, 23

18

18 → 5, 7, 11, 13, 17, 19, 23, 29  
 12 → 5, 7, 11, 13, 17, 19, 23, 29  
 8 → 3, 5, 7

$$\begin{aligned} b+c+7 &= 9y \\ b+c+8 &= 9y \\ b+c &= 1 \\ \text{or } b+c &= 10 \end{aligned}$$

6 → 5, 4 → 3, 2 → 2.

with b-c=4, b+c=1 not possible as b, c not integers  
 b-c=4, b+c=10, b=7, c=7

1735

$$1736 \div 7 \checkmark$$

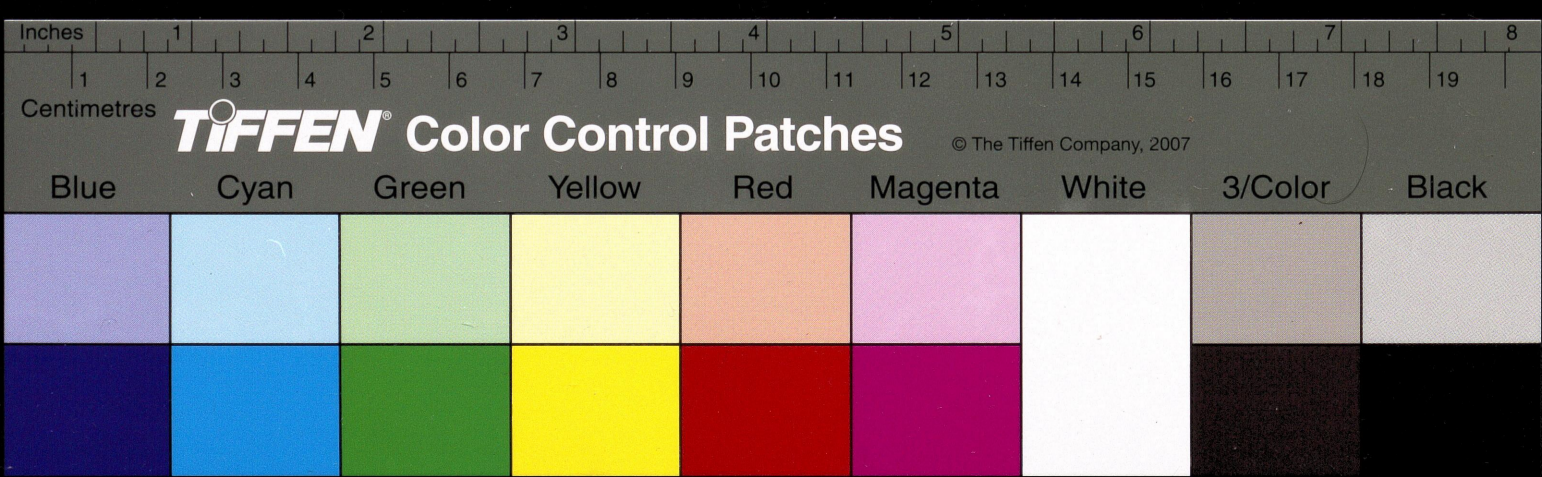
$$13x + 17y = 3000$$

- x=5, x
- x=10
- x=15

$$\begin{array}{r} 3000 \\ 65 \\ \hline 2935 \end{array}$$

$$\begin{array}{r} 3000 \\ 195 \\ \hline 2805 \text{ (165)} \\ 17 \\ \hline 110 \\ 102 \\ \hline 85 \end{array}$$

$$\begin{aligned} 169 - 36 &= 133 \\ 133 + y &= 72t \\ y &= 72t - 133 \end{aligned}$$



$$68) \begin{array}{r} 157 \\ 136 \\ \hline 21 \end{array} \begin{array}{l} (2 \\ (3 \\ (4 \end{array}$$

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

$$\begin{array}{l} 5x - 7y = -1 \quad 11x - 9y = 1 \\ 7y - 9z = 1 \\ 7x - 5y = 1 \end{array}$$

$$x = 4 + 9t, y = 5 + 11t$$

$$1 + \frac{4}{13}$$

$$0 + \frac{1}{1} + \frac{1}{3} + \frac{1}{4}$$

$$\frac{0}{1}, \frac{1}{1}, \frac{3}{6}, \frac{13}{11}$$

$$\begin{array}{r} 5) 21 \\ 20 \\ \hline 1) 5 \\ 4 \\ \hline 1) 1 \\ 0 \end{array}$$

$$9) \begin{array}{r} 11 \\ 9 \\ \hline 2) 9 \\ 8 \\ \hline 1) 2 \\ 1 \\ \hline 1) 1 \\ 0 \end{array}$$

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

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

$$\frac{1}{1}, \frac{5}{4}, \frac{6}{5}, \frac{11}{9}$$

$$\begin{array}{r} 7) 5 \\ 4 \\ \hline 1) 1 \\ 0 \end{array}$$

$$\begin{array}{r} 5) 7 \\ 5 \\ \hline 2) 2 \\ 4 \\ \hline 1) 2 \\ 0 \end{array}$$

$$0 + \frac{1}{1} + \frac{1}{2} + \frac{1}{2}$$

$$11x - 9y = 1$$

$$11 \cdot 5 - 9 \cdot 6 = 1$$

$$\frac{11}{9} = 1 +$$

$$5x + 1 = 7y$$

$$5x + 2 = 9z$$

$$5x + 3 = 11w$$

$$11w + 7y = 18z$$

$$x = 4, y = 3$$

$$x = 5, z = 3$$

$$x = 6, w = 3$$

$$\frac{11}{9} = 1 + \frac{1}{4} + \frac{1}{2}$$

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

$$\begin{array}{r} 99 \\ 55 \\ 35 \end{array} \begin{array}{r} 44 \\ 20 \end{array}$$

$$x = 4 + 7t, y = 3 + 5t$$

$$x = 5 + 9t', z = 3 + 5t'$$

$$x = 6 + 11t'', w = 3 + 5t''$$

24

$$248, 193, 158$$

$$1736, 1737, 1738$$

$$1733, 1734, 1735$$

$$245, 190, 155$$

$$49, 38, 31$$

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

$$\begin{array}{r} 7) 9 \\ 7 \\ \hline 2) 7 \\ 6 \\ \hline 1) 2 \\ 0 \end{array}$$

$$41735$$

$$1736$$

$$343, 1737$$

$$1738 = 39 + 63t'$$

$$347 = 39 + 63(6 + 11t'')$$

$$248 = 39 + 378 + 63t'$$

$$193 = 417 + 693t''$$

$$158$$

$$341$$

$$31 \quad t'' = 0, 417$$

$$2(a+c) = 9x + 1$$

$$0 = 9x - 26 - 15$$

$$9t' + 5 = 4 + 7t$$

$$9t' - 7t = -1$$

$$t = 4 + 9u$$

$$t' = 3 + 7u$$

$$abc5$$

$$abc6$$

$$abc7$$

$$abc8$$

$$347$$

$$1736$$

$$193$$

$$1737$$

$$1738$$

$$a + c = 6 + 8$$

$$a + c = 9x - 6 - 7$$

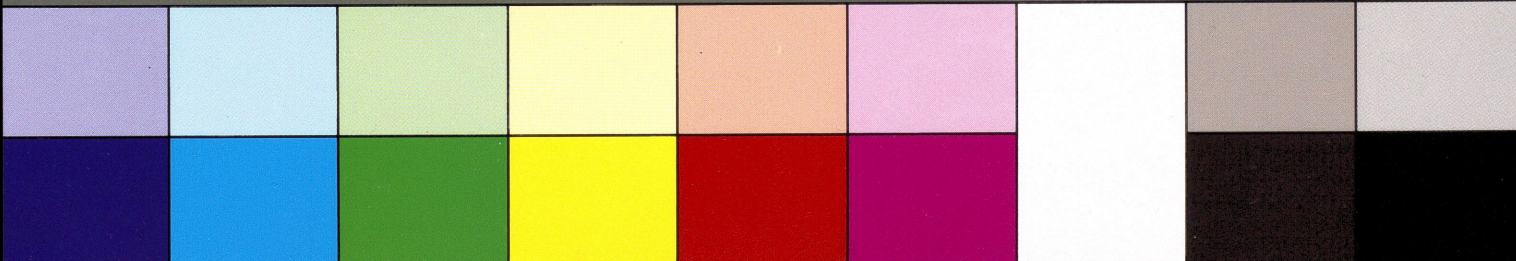
Inches 1 2 3 4 5 6 7 8

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

**TIFFEN** Color Control Patches

© The Tiffen Company, 2007

Blue Cyan Green Yellow Red Magenta White 3/Color Black



$$5x + 1 = 7y$$

$$5x + 2 = 9z$$

$$5x + 3 = 11w$$

$$7y + 1 = 9z$$

$$7y + 2 = 11w$$

$$11w - 9z = 1$$

5

$$11x \equiv 1 \pmod{9}$$

$$11x \equiv 2 \pmod{7}$$

$$11x \equiv 3 \pmod{5}$$

$$7y + 2 = 55$$

$$7y + 1 = 54$$

$$w = 5 + 9t$$

$$z = 6 + 11t$$

$$\begin{matrix} 55 + 99t \\ - 54 - 99t \\ \hline \end{matrix}$$

$$7y + 1 = 9(6 + 11t)$$

$$7y + 2 = 11(5 + 9t)$$

$$5 + 9(3 + 7u)$$

$$= 32 + 63u$$

$$= 32 + 63(2 + 5v)$$

$$= 32 + 126 + 315v$$

$$= 158 + 315v$$

$$14 + \frac{1}{7} \quad \underline{v=0}$$

$$7y - 99t = 53$$

$$7y - 99t = 53$$

$$7 \overline{) 99} \begin{matrix} 14 \\ 98 \\ \hline \end{matrix}$$

$$1 \overline{) 7} \begin{matrix} 7 \\ \hline 0 \end{matrix}$$

$$\frac{14}{1}, \frac{99}{7}$$

$$y = 53 + 99t'$$

$$t = 4 + t'$$

$$= 742 + 7t'$$

$$t = 53 + 7t'$$

$$y = 742 + 99t'$$

$$\begin{matrix} 5247 \\ 5094 \\ \hline 53 \end{matrix}$$

$$\begin{matrix} 53 \times 99 \\ \hline 477 \end{matrix}$$

$$\begin{matrix} 477 \\ \hline 5247 \end{matrix}$$

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

$$\begin{matrix} 158 \\ 5 \\ \hline 154 \end{matrix}$$

$$9t - 7t' = -1$$

$$5 + 9t = 4 + 7t' = 3 + 5t''$$

$$9t - 5t'' = -2$$

$$t = 3 + 7u$$

$$t' = 4 + 9u$$

$$t = 2 + 5v$$

$$t'' = 4 + 9v$$

$$\begin{matrix} 9 \\ 5 \overline{) 9} \begin{matrix} 1 \\ 5 \\ \hline 4 \end{matrix} \begin{matrix} 1 \\ 5 \\ \hline 1 \end{matrix} \\ 4 \overline{) 5} \begin{matrix} 1 \\ 4 \\ \hline 1 \end{matrix} \end{matrix}$$

$$\frac{4}{2}$$

$$19 - 20$$

44

153

154

155

$$\begin{matrix} 9 \\ 7 \overline{) 9} \begin{matrix} 1 \\ 7 \\ \hline 2 \end{matrix} \\ 2 \overline{) 7} \begin{matrix} 3 \\ 6 \\ \hline 1 \end{matrix} \\ 1 \overline{) 2} \begin{matrix} 2 \\ \hline 0 \end{matrix} \end{matrix}$$

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

$$t, \frac{4}{3}, \frac{9}{7}$$

Inches 1 2 3 4 5 6 7 8

Centimetres

TIFFEN Color Control Patches

© The Tiffen Company, 2007

Blue

Cyan

Green

Yellow

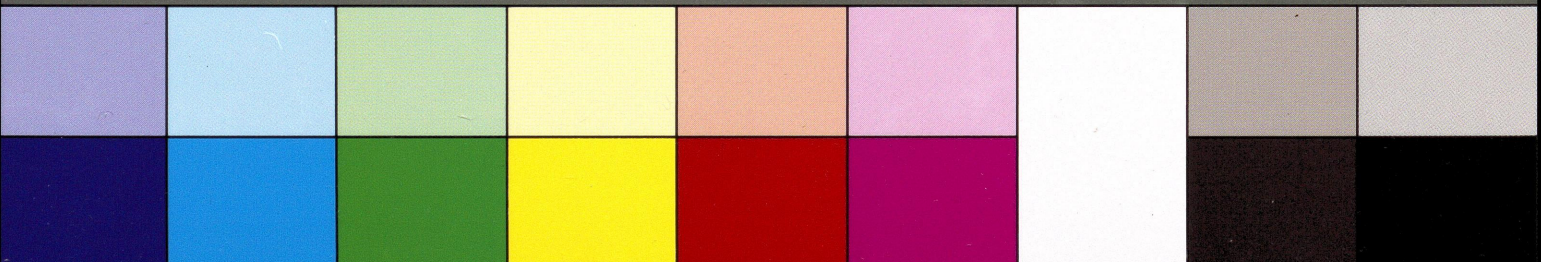
Red

Magenta

White

3/Color

Black





(1) 2551.

2^3 \* 5^3

(2) (a+b)(a-b) = 5 \* 11

a+b = 11     a+b = 55  
a-b = 5     a-b = 1  
a=8, b=3     a=28, b=27

156  
468  
-----  
1836

2551.  
2557

(3) 2000 = 2^4 \* 5^3     ∴ n = (4+1)(3+1) = 20

∴ = (2^5 - 1) / (2 - 1) \* (5^4 - 1) / (5 - 1) = 31 \* 156 = 4836

624 / 4

(4) (a+1)(b+1)(c+1) = 2 \* 3 \* 4

N = 2^a \* 3^b \* 5^c with a=3, b=2, c=1, n = 4 \* 3 \* 2 = 24

and N = 2^3 \* 3^2 \* 5 = 8 \* 9 \* 5 = 360

(5) 
$$\begin{array}{r} 195 \\ 2805 \\ \hline 3000 \end{array}$$
 4\*6  
x=15  
y=165

(6) No rep = 32 For eg. 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59,

17, 23

1735 }  
1736 } 432  
1739 } 425  
1738 }

10, 19-18+4

375 }  
65 } 10, 5

∴ Total = 17 + 10 + 7 + 5 + 4 + 12 + 6 + 2

no. divisible by 4 are 2,

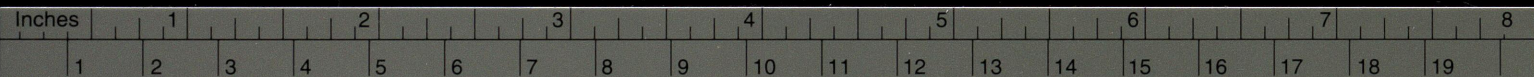
no. not prime to 64 are 2, 4, 6, 8, 10, 12, ... 64

∴ this no = 2(1+2+...+32) = 32

∴ no. prime to it are 32, for 1024 ans is 572

1024 =

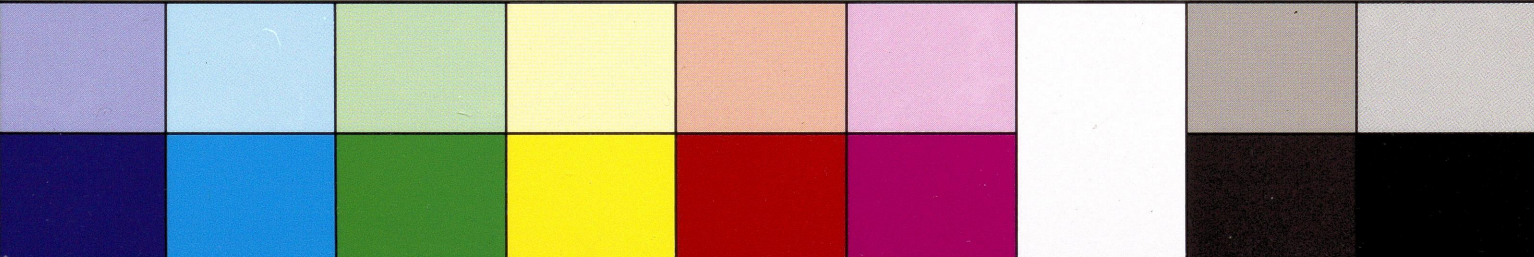
(7) 7 and 9. (8) 1/4 + 2/5 + 1/7 = (35+56+20)/140 = 111/140



TIFFEN Color Control Patches

© The Tiffen Company, 2007

Blue Cyan Green Yellow Red Magenta White 3/Color Black



My dear Anantharamiah,

I find it rather difficult to make a proper assessment of the mathematical talents of Miss A. S. Nalini from the data left with me. It is not clear whether she is able to give instant answers to ~~the~~ <sup>all</sup> problems relating to multiplication, squaring, cubing & finding fourth powers of the types mentioned. If this be ~~she~~ so, it is certainly an unusual talent, but what is more important is to know ~~what is~~ the modus operandi<sup>(1)</sup> adopted by her in arriving at the instant answers. Equally ~~unusual~~ unusual is her inability to find an answer the product  $5555 \times 5675$ .

Apart from the numerical gymnastics contained in the problems given to her, I would like to know if ~~she~~ the candidate ~~has~~ knows or taken interest in more fundamental problems relating to ~~the~~ related to the theory of numbers like prime numbers & their distributions,<sup>(2)</sup> diophantine equations, etc, etc. ~~only~~

After receipt of information regarding points (1) & (2) I have mentioned above, I shall probably be able to arrive at a satisfactory assessment.

Yours sincerely  
B.S.M.

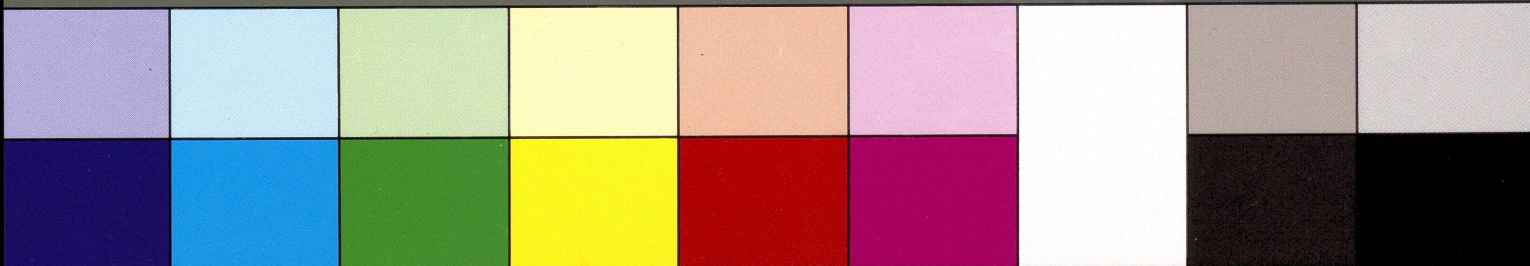
Inches 1 2 3 4 5 6 7 8

Centimetres

**TIFFEN** Color Control Patches

© The Tiffen Company, 2007

Blue Cyan Green Yellow Red Magenta White 3/Color Black





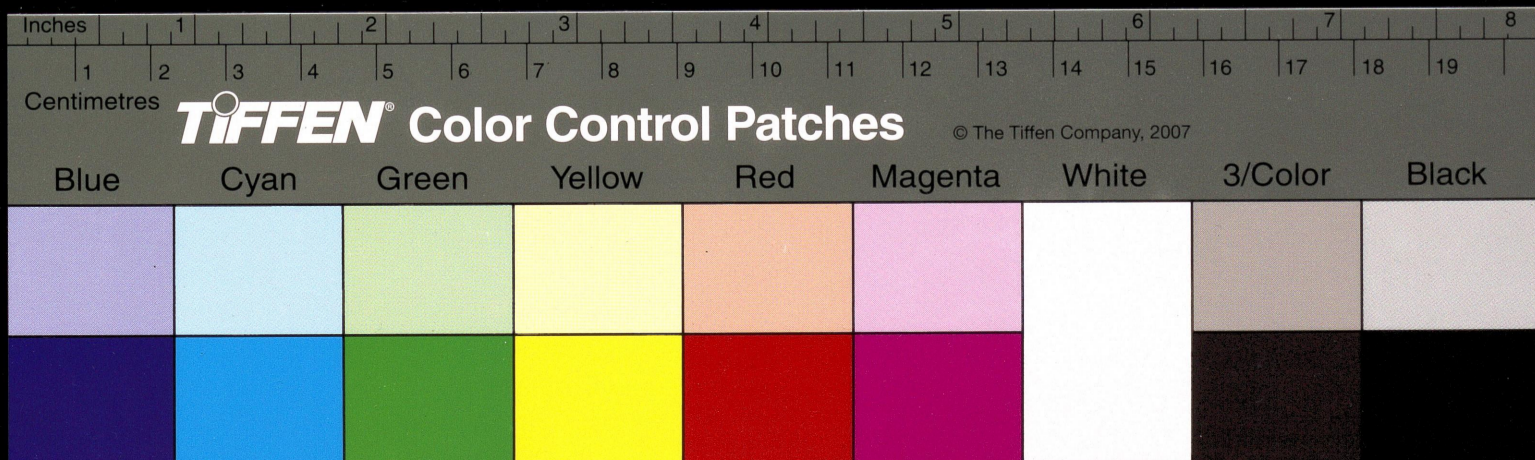
Nalini

1. Squares upto 1000 and square roots upto 1000
2. Cubes " 100 and cube " 100
3. 4th power " 50 and 4th " 50
4. Multiplication upto 3 figures and 2 figures.
5. Tables upto 5 figures. E.g. 26783 x 1,2,3,4,5,6,7,8,9,10.
6. Tables of fractions upto 40 e.g.  $37 \frac{19}{32}$  x do.
7. Division: Upto any 5 figures by 4 figures, 3 figures, 2 figures and 1 figure.
8. Addition: 3 figures - 8 lines.  
4 " - 6 lines  
2 " - 20 lines
9. Addition of any 4 figures ending with fractions of  $\frac{1}{3}$ ;  $\frac{1}{6}$ ;  $\frac{1}{9}$ ;  $\frac{1}{64}$ ;  $\frac{1}{32}$ ;  $\frac{1}{16}$ ;  $\frac{1}{8}$  within 40.  
e.g.  $29 \frac{1}{16}$  plus  $32 \frac{1}{9}$  plus  $18 \frac{1}{8}$  plus  $39 \frac{1}{3}$  ?
10. Subtraction: upto 5 figures.
11. Combination: Combination of squares, addition, subtraction, division, etc.  
e.g.  $26^3$  plus  $192^2$  plus  $2873 - 3864 \div 172$  ?
12. Consecutive odd and even numbers upto 5 figures which is divisible by 3.  
e.g. 291. The consecutive 3 odd Nos. for this is 95, 97 and 99.

-----  
*Anantharamiah*

My dear Anantharamiah,

I am sorry for the inordinate delay in replying to your letter dated 15/3/69. As I spoke to you on the phone yesterday, I had to attend to some urgent work like paper setting, reviewing, refereeing and moderation, and I see from your letter that you have again <sup>sent me</sup> the same type of samples relating to the talents shown by Ch. Nalini. ~~you have mentioned that she has not studied mathematics in the school~~ Does it mean that she ~~is~~ There is no point in asking her to come over to Bangalore just for the purpose of an oral test; in such matters, it is not desirable to rely upon the judgment of a single individual. I am, however, enclosing herewith a number of problems, and I would like to know her answers to them (arrived at without reference to books or help from others) and the time taken in answering them. After this, I shall probably be able to arrive at a proper assignment.



Anantaram

"Anuragaram"

No. 9. Bealie Cross St.

Bangalore 25

My dear Madhav Das,

15.3.69

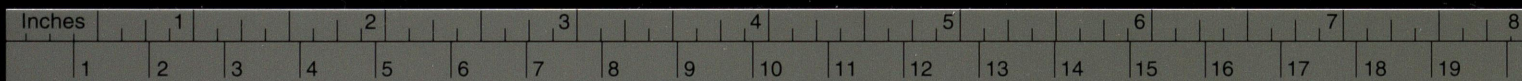
It was very kind of you to have gone into the question of the talents of Mr. Nalini, my brother's grand daughter. I recd from her father (my nephew) Sri A. C. Satyana - Prayana - now in Shahabad - a letter yesterday, describing her talents, as typed overleaf & offering to come here with the job in the 11<sup>th</sup> week of April. Her answers are instantaneous.

We have not been able to make out her "modus operandi". She has not studied mathematics in the school.

Anyway you will agree that it is best that you should have an opportunity of testing her talents personally. Since you are "Wanted" throughout India, please let me know whether you will be in B'lore in the 11<sup>th</sup> week of April. Otherwise

please suggest any subsequent time convenient to you.

Thanking you again  
yrs sincerely  
Anantaram



Centimetres

**TIFFEN** Color Control Patches

© The Tiffen Company, 2007

Blue

Cyan

Green

Yellow

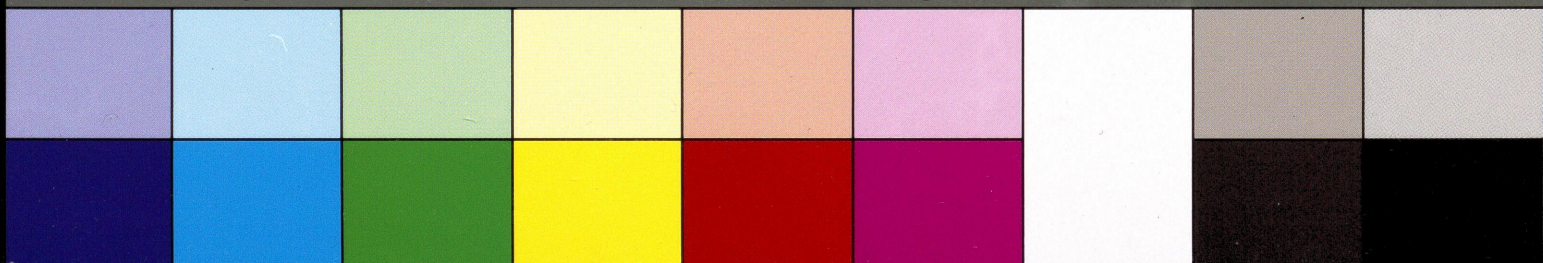
Red

Magenta

White

3/Color

Black



DETAILS OF MISS. A. S. NALINI

Studying in P.U.C (Arts).  
S.S.Margol College of Arts & Science.  
Shahabad,  
Gulbarga District.

She can give ready answers to the following problems:

Multiplication:

- 2 figures x 2 figures. e.g. 87 x 76.
- 3 figures x 2 figures.
- 4 figures x 1 figure.

Squares upto 1000  
Cubes upto 100  
4th power upto 50

Adding:

- 4 figures - 3 lines.
- 3 figures - 4 lines.

Combination:

Eg.  $22^3 + 16^4 - 672$  divided by 68 ?

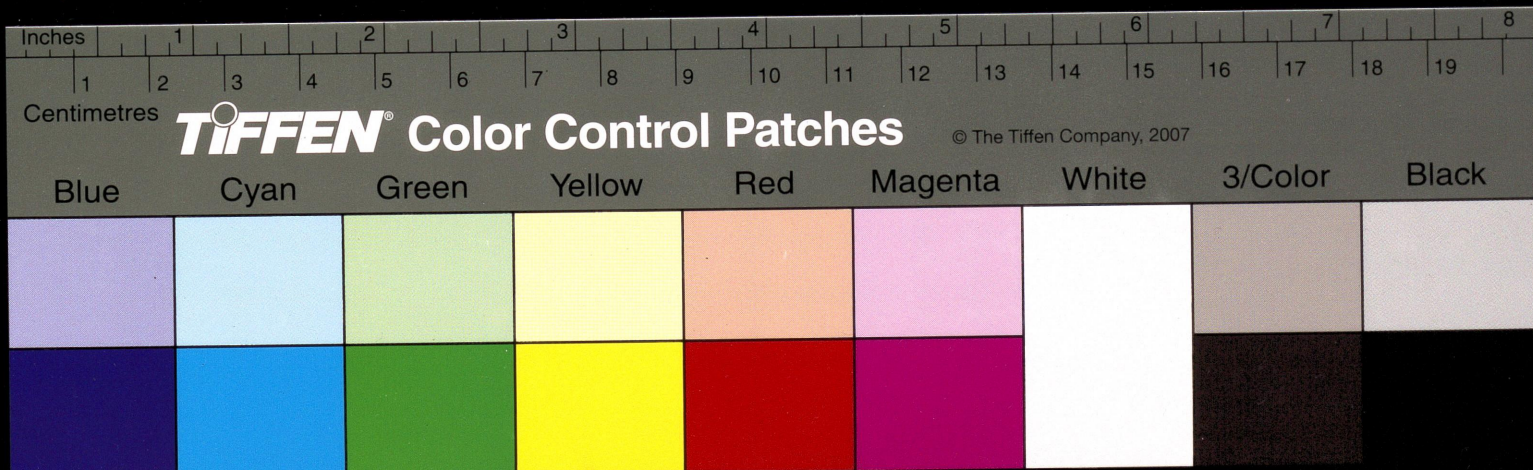
Tables:

upto 4 figures.  
fractions upto 20.

Answers obtained to problems given:

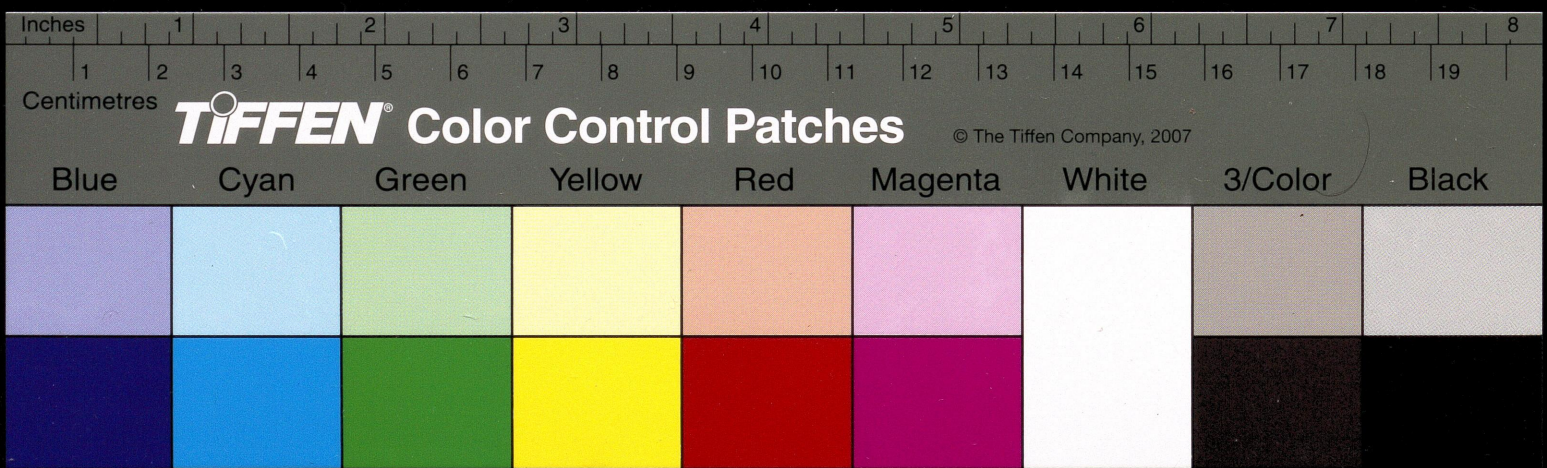
	<u>Problem.</u>	<u>Answer.</u>	<u>Time interval.</u>
1.	48 x 99	9752 ✓	Instant answer.
2.	$(621)^2$	385641	Instant answer.
3.	33 x 144	4752	Instant answer.
4.	$86 \times \sqrt{256036}$	-	Did not answer.
5.	$86 \times \sqrt{2809}$	4644	4558 - 20 seconds.
6.	$\sqrt[3]{24389}$	29	Instant answer.
7.	$\sqrt[3]{\frac{19683}{729}}$	$\sqrt[3]{27} = 3$	5 seconds.
8.	Express 69876 as a sum 3 consecutive even Nos.	Ans: 23290 + 23292 + 23294.	10 seconds.

... 2.



<u>Problem.</u>	<u>Answer.</u>	<u>Time interval.</u>
9. 891 Express Alt. $\begin{array}{r} 99 \times 9 \ ) \\ 81 \times 11 \ ) \\ 297 \times 3 \ ) \\ 27 \times 33 \ ) \end{array}$	Divisor/Divided	Instant Answer.
10. 5555 x 5675	-	No answer.
11. $\frac{5675}{5555} =$	Ans: $\frac{24}{1111}$	Instant answer.
12. $\frac{1879}{326} =$	$5\frac{259}{326}$	5 Seconds. (Can't answer in decimals).
13. 79877 As sum of 3 odd Nos.	26623 26625 26629	No answer. Instant answer.

----- \* -----



A. N. Sumbawani

"Amagahani"

9. Bertie Cross

B' love 25

---

