



NAVPRAYAS
(A GROUP OF INNOVATIVE THOUGHTS)

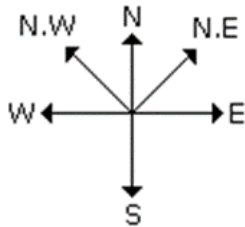
PUZZLE RACE

Junior Group Answer Key 2023

❖ Qualifier 1

Ans: (C)

As North-West is 135° clockwise from South in the same way North-East is 135° clockwise from the West.



Round A

A1) Ans: 5

Each word is coded by the number of different alphabets present in the word (no repetition). Number of different alphabets in "LETTERS" are 5.

A2) Ans: Seven minutes

One adult takes seven minutes to eat a cupcake.

A3) Ans: C

A4) Ans: 64

the numbers are squared in ascending order

In first circle,

$$(3)^2 = 9$$

$$(4)^2 = 16$$

$$(5)^2 = 25$$

$$(6)^2 = 36.$$

In second circle,

$$(4)^2 = 16$$

$$(5)^2 = 25$$

$$(6)^2 = 36$$

$$(7)^2 = 49.$$

In third circle,

$$(6)^2 = 36$$

$$(7)^2 = 49$$

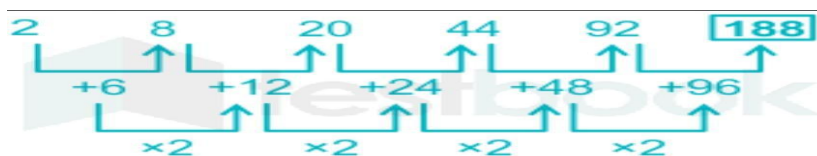
$$(8)^2 = 64$$

$$(9)^2 = 81.$$

A5) Ans: 40

$$25/(1/2) - 10 = 40$$

A6) The pattern follows :



Hence, the correct answer is "92".

A7) A common wrong answer is \$10. Now, suppose we each had, say, \$50. If I gave you \$10, you would then have \$60 and I would have only \$40; hence you would have \$20 more than I, rather than \$10. The correct answer is **\$5**.

A8) Ans: 2 kilogram

Let x be the weight of bottle $1 + (x/2) = x$

On solving, $x=2$ kg

A9) Ans: Dice

It has 6 faces and a total of 21 dots or say eyes.

A10) Ans: 8

When you turn the number "8" on its side, it becomes the symbol for infinity (∞), which represents everything or limitless possibilities. However, if you cut the number "8" in half vertically, you get two separate parts that no longer resemble the original shape of the number. Each half becomes a "0," which represents nothing or zero.

❖ Qualifier 2

Ans 32.

Each number is simply its position on the grid defined by row and column, but counting from the right. So 45 is column 4 counting from the right, and row

5, counting from the bottom.

Round B

B1) Ans: 29

Every time a match is held, one player is eliminated and to eliminate 29 of the 30 players, 29 matches are required.

B2) Ans: 12 kids

Six kids had juice and cake, (10 - 6) i.e., four kids had only juice and (8 - 6) i.e., two kids had only cake.

B3) Ans: 121.

As the number is divisible by 11 and also remainder when divided by 2, 3, 4, 5 or 6 is 1. So check 11, 22, 44, 55, 66, 77, 88, 99, 110, **121**.... Here 121 is the smallest number

B4) Ans: 60 minutes

For 1 hour, 20 minutes is slower, then for

06 minutes - 02 minutes is slower

30 minutes - 10 minutes

Actual time | false time

12:00 PM 12:00 PM

01:00 PM 12:40 PM (20 minutes slower)

02:00 PM 01:20 PM

03:00 PM 02:00 PM

60 minutes is lost.

B5) The word "Long".

B6) Teapot / Treatment

B7) Ans: 22

Buy and eat 15 chocolates

Return 15 wrappers and get 5 more chocolates.

Return 3 wrappers, get 1 chocolate and eat it (keep 2 wrappers)

Now we have 3 wrappers. Return 3 and get 1 more chocolate.

So total chocolates = $15 + 5 + 1 + 1$

B8) Ans: 4 brothers and 3 sisters

Solution:

Let no. of boys =b

And that of girls =g

For each boy,

$$g=b-1 \Rightarrow b-g=1 \text{ and } b+g=7$$

$$b=4 \text{ and } g=3$$

B9) Ans: coconut

As coconut can be eaten, coconut water can be used to satisfy thirst and the fibres of the coconut shell can be burnt to create fire to prevent oneself from the cold.

B10) Ans: Saturday.

Since 1996 is a leap year, So February has 29 days.

Now Odd days between 1 february and 3 march will be the remainder of $(28+3)/7$ i.e. 3. 3rd march will be (wednesday + 3 days) i.e. **Saturday**.

❖ Qualifier 3

Ans : 25000 miles

Solution: Divide the lifetime of the spare tyre into 4 equal parts i.e., 5000 and swap it at each completion of 5000 miles distance.

Let four tyres be named as A, B, C and D and the spare tyre be S.

- 5000 miles: Replace A with S. Remaining distances (A, B, C, D, S) : 15000, 15000, 15000, 15000, 20000.
- 10000 miles: Put A back to its original position and replace B with S. Remaining distances (A, B, C, D, S) : 15000, 10000, 10000, 10000, 15000.
- 15000 miles: Put B back to its original position and replace C with S. Remaining distances (A, B, C, D, S) : 10000, 10000, 5000, 5000, 10000.

- 20000 miles: Put C back to its original position and replace D with S. Remaining distances (A, B, C, D, S) : 5000, 5000, 5000, 0, 5000.
- 25000 miles: Every tyre is now worn out completely.

Round C

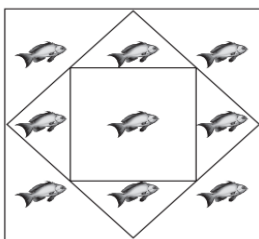
C1) Ans: 99.22%

Kapoor ate half paratha on Monday. On Tuesday, he would have eaten half of the remaining paratha i.e. $1/4$ of the original paratha. Similarly, he would have eaten $1/8$ of the original paratha on Wednesday and so on for the seven days.

Total paratha Kapoor ate during the week is
 $= 1/2 + 1/4 + 1/8 + 1/16 + 1/32 + 1/64 + 1/128$
 $= 127/128$
 $= 99.22\%$ of the original paratha

C2) You have to pick **only one edible** from jar C. Suppose the edible is a candy, then the jar C contains candies only (because all the jars were mislabeled). Now, since jar C has candies only, Jar B can contain sweets or mixtures. But, jar B can contain only the mixture because its label reads "sweets" which is wrong. Therefore, Jar A contains sweets. Thus, the correct labels are: A: Sweets. B: Candies and Sweets. C: Candies.

C3) To get 56 pieces, the girl will have to put only 55 cuts. i.e. she can cut 56 pieces in 55 seconds.



C4)

C5) $199 - 99 = 100$

C6) Ans: 0

$(Y - A) * (Y - B) * (Y - C) * \dots * (Y - Y) * (Y - Z)$ equals 0 since $(Y - Y)$ is zero

C7) Ans: 16 days

100% of task = 18 days

As he doubles the task everyday.

So, 50% of task = 17 days

25% of the task = 16 days.

C8) There are 39 blocks.

C9) As it is given that only one of the four declarations is correct, the correct number can not appear in more than one declaration. If it appears in more than one declaration, then more than one declaration will be correct. Hence, there are **8 sweets under each cup.**

C10) Ans: To the **6**

Starting with the top left clock face(02:05) and working clockwise around the others, the sum of the numbers pointed to by the 2 hands starts at 3 and increases by 2 each time.

❖ Qualifier 4

By experiment we can find the only numbers that can be turned upside down and still read as a number are 0, 1, 6, 8 and 9.

The numbers 0, 1 and 8 remain 0, 1 and 8 when turned over, but 6 becomes 9 and 9 becomes 6. Therefore, the possible numbers on the bus were 9, 16, 81, 100, 169 or 196. However, the number 196 is the only number which becomes a perfect square when turned over because 961 is the perfect square of 31. Therefore, **196** is the correct answer.

Round D

D1) 19 days

D2) 245



D3) Ans :- NEED ALPHA

$$A=01= 0 \times 2^1 + 1 \times 2^0 = 1$$

$$B=10= 1 \times 2^1 + 0 \times 2^0 = 2$$

$$C=11=1 \times 2^1 + 1 \times 2^0 = 3$$

$$D=100=1 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 = 4 \text{ and so on.}$$

Similarly,

$$1110=14=N, 101=5=E, 100=4=D, 01=1=A, 1100=12=L, 10000=16=P, \\ 1000=8=H$$

D4) Make two sets of coins, with each having 5 coins,

For Example, Set-1: H H T T T and Set-2: T H T H H

Now rotate all the coins in Set-2, which would give, Set-1: H H T T T and Set-2: H T H T T.

Each set has 3-3 Tails. Similarly, the algorithm works for any set with equal coins with any sequence.

D5) $49 \times (6 \times 5 + 3) + (6 \times 6) = 1653$.

From Over 1 to 49:

1st ball :- 6 runs(hit six)

2nd ball :- 6 runs(hit six)

3rd ball :- 6 runs(hit six)

4th ball :- 6 runs(hit six)

5th ball :- 6 runs(hit six)

6th ball :- 3 runs(took 3 runs between the wickets and take back the strike)

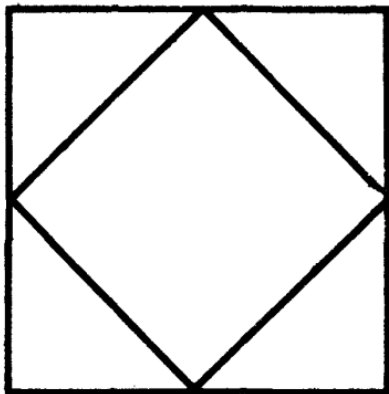
=> $49 \times (6 \times 5 + 3)$

50th Over:

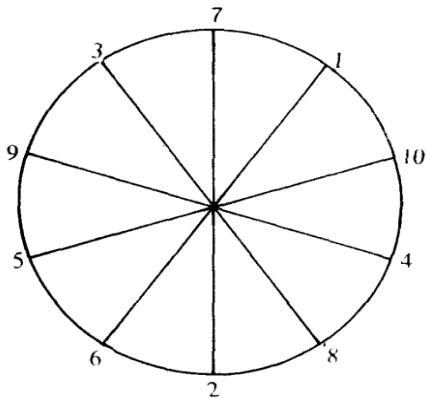
Hit six sixes in a row

=> 6×6

D6)

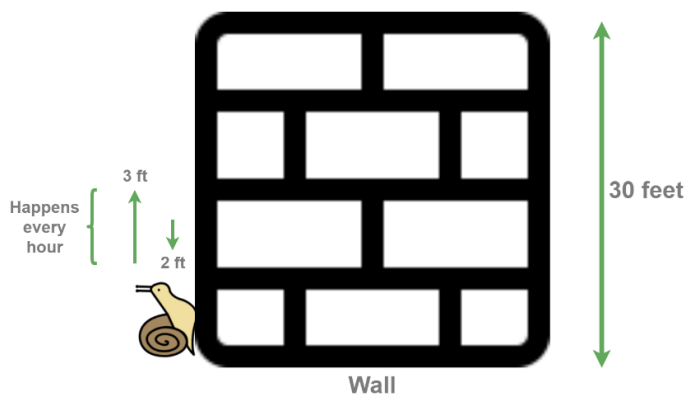


D7)



D8) Ans: 28 hours

1. Every hour the snail climbs up 3 feet, it slides down 2 feet. So, the actual height it is climbing in 1 hour is 1 foot.
 2. Similarly, in 25 hours, the snail would have climbed 25 feet, in 26 hours it would have climbed 26 feet and in 27 hours it would have climbed 27 feet, but things change after 27 feet.
 3. As we know, the snail covers 3 feet up in 1 hour. So, in the 28th hour, the snail would have climbed 30 feet up the wall and would have reached atop the wall.
- Therefore the answer to this riddle is 28 hours.



D9) 6pm

Explanation:

The time after 24, 000, 000 hours will be the same as it is now. We want the time 3 hours before that and thus you can deduct three hours from 9 pm. So the time will be 6 pm.

D10) The doctor is the mother of the son, whereas the father of the son is not a doctor.

❖ Qualifier 5

a b c d e (digits of given number)

2 prime digits

$9 \geq c > a, d, e > b \geq 1$

$a > d + e$

$e = d/2$

$a = c - 1$

$b < e = a+1 > a, e, 2e > b \geq 1$

$a > 2e + e = 3e$

$e > b \ \& \ b \geq 1 \Rightarrow e \geq 2$

if $e \geq 3$ then $a > 3e \geq 9$, but a can't be greater than 9 so e can't be greater than or equal to 3, which means $e = 2$

$\Rightarrow d = 4, b = 1$

e is prime, but b and d are not, which means that a or a+1 is prime

$a+1 \ a \ 3e \Rightarrow a > 6$,

so a can be 7 or 8, since 7 is only prime digit of digits 7, 8, 9 then a must be 7 and $c = a+1 = 8$

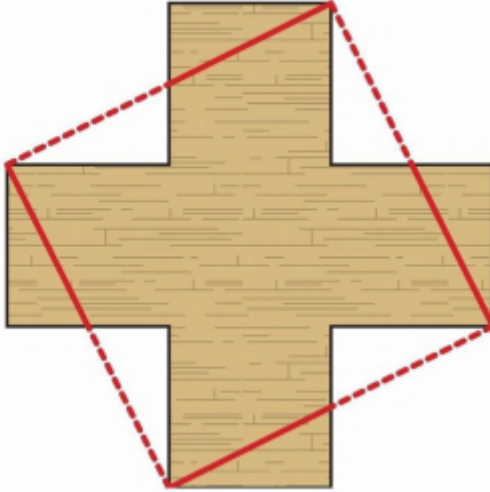
conclusion: $a = 7, b = 1, c = 8, d = 4$ and $e = 2$

number: **71842** (2 and 7 are prime, 8 is the highest digit, 1 is the lowest digit, 7 is higher than the sum of 4 and 2, 2 is half of 4, 7 is smaller than 8, 2 is between 1 and 7).

This question may have other answers for example **71942**.

Round D

E1)



E2) At the beginning of the first hour feed the rat the 1st bottle. At the start of 2nd-hour feed, the 2nd one and similarly at the start of the 3rd-hour feed, the 3rd bottle. If the rat dies after exactly 10 hrs, the first bottle is poisonous. If it dies after 11 hours, the 2nd one contains poison, and the 3rd one is poisonous. In this way, after exactly 12 hours you would be able to determine the poisonous bottle.

E3) The Shortest time is 30 minutes.

The logic is as follows :

A and B takes 4 minutes

Return in B another 4 minutes

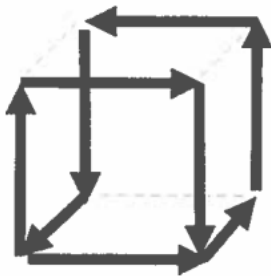
C and D takes 16 minutes

Return in A takes 2 minutes

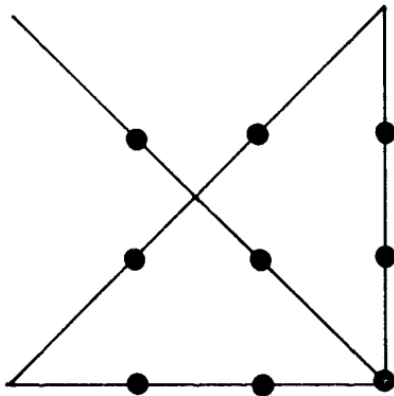
Now take A and B takes 4 minutes

So total time taken is : $4+4+16+2+4 = 30$ minutes

E4) You can trace nine edges, so the total distance is 45 cm. One possible path is shown:



E5)



E6) Ans - Thirty litres.

The way to solve it is to work backwards—to get zero after the fourth hour it must have lost one plus one more. So in the third hour it must have lost half of six, plus one more to leave two and so on.

E7) When she buys 40 units on the first day(monday), number of days she can survive = $40/5 = 8$ days.

On the 9th day , she comes to buy 40 units of food which will continue for the next 8 days .

This will help to survive her for 16 days.

For the 17th day she was required to go again to buy food.

Thus the minimum number of days she visited the shop to buy food to survive 17 days are **3 days**.

E8) If we light a stick, it takes 60 minutes to burn completely. If we light the stick from both sides then It will take exactly half the original time, i.e. 30 minutes to burn completely.

1. 0 minutes – Light stick 1 on both sides and stick 2 on one side.



E9) Let the bulbs be X, Y, and Z.

Turn on switch X for 5 to 10 minutes. Turn it off and turn on switch Y. Open the door and touch the light bulb.

- i) The light is on from the bulb, it is Y
Now check the other two off bulbs.
- ii) The bulb which is hot, is X.
- iii) The bulb which is cold, Z.

E10) Let us name the chains as 1, 2, 3, 4, 5 each having three links.

Take chain 1 and break open all three links: $1 \times 3 = 3$ Rs.

Take one open link to connect chain 2 and 3: 3 Rs.

Take another open link to connect chain 3 and 4: 3 Rs

Take a third open link to connect chain 4 and 5: 3 Rs.

Now you have one long chain ready in only 12 Rs

BOOSTER ROUND

1. 96 cm.
The head is 12 cm.
The tail is $24 + 12 = 36$ cm.
The body is $12 + 24 + 12 = 48$ cm.
 $12 + 48 + 36 = 96$ cm.
2. Friday.

The “day before tomorrow” is today; “the day before two days after” is really one day after. So if “one day after today is Saturday,” then it must be Friday.

3. Ans 9312

1st digit = no. of letters in the word

2nd digit = position of the day in the week

3rd digit = sum of 1st and 2nd digits

Wednesday= 9 letters, 3 position , sum=12 :- answer is 9312

4. The numbers in the inner ring correspond to the number of lines used to make the letters in the outer ring. So, the answer is **4**.

5. 2

6. After midnight at 9.00 A.M. Movement = $30 \times 8 = 240^\circ$. In 20 minutes movement = $20 \times 30 / 60 = 10^\circ$ Total = $240^\circ + 10^\circ = 250^\circ$.

7. The day after March 11 is Thursday means March 12 is Thursday.

March has 31 days.

so, $(31 - 12 + 1) / 7 = 19 / 7 = 5$

1 Thursday

2 Friday

3 Saturday

4 Sunday

5 (last day of the month) Monday

So the answer is **Tuesday**.

8. Total value = $4 + 2 + 2 + 3 = 11$.

9. 11

$(3 \times 4 - 8) = 4$, $(2 \times 5 - 4) = 6$, $(4 \times 5 - 9) = 11$

10. Jalka means happy;

Mofti means birthday;

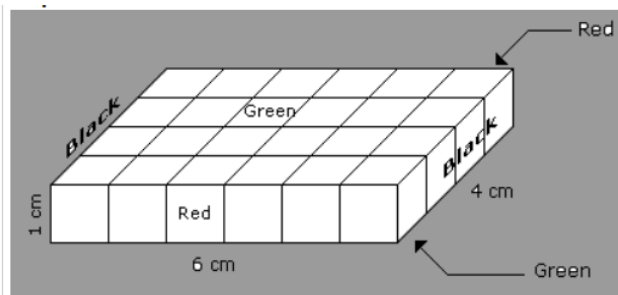
hoze means party;

mento means good;

gunn means the suffix “ness”.

Happiness means Jalkagunn.

11.



There are 16 small cubes attached to the outer walls of the cuboid.
Therefore remaining inner small cubes will be the cubes having two sides green coloured.

So the required number = $24 - 16 = 8$

12. Let $(\frac{1}{7})20 = x$

$\Rightarrow 7x = 20$

Given that $(\frac{1}{3})15 = 7$

Therefore, $(\frac{15}{3})x = 20$

$\Rightarrow x = \frac{20}{7} = 4$

13. Given total number of rats = 999919

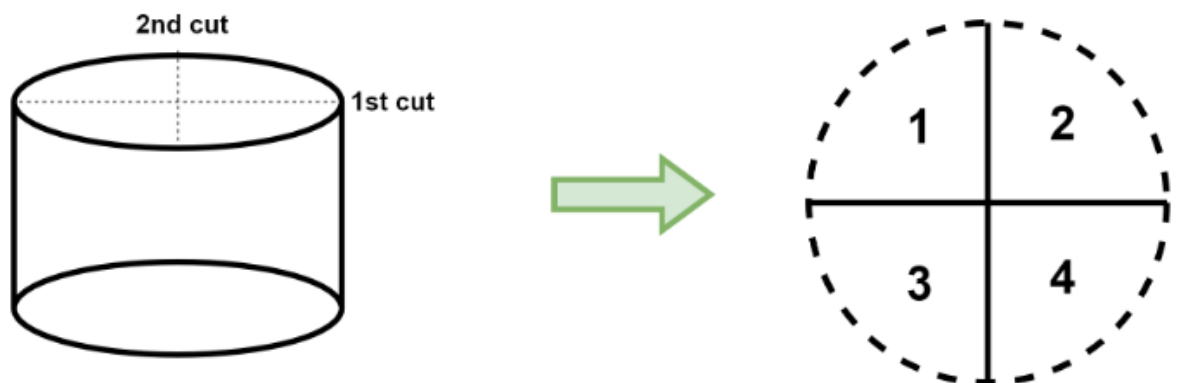
$999919 = 1000000 - 81 = (1000^2 - 9^2)$

$1000^2 - 9^2 = (1000+9)(1000-9) = 1009 \times 991.$

Since there were more rats than there were cats, 991 cats killed 1009 rats each.

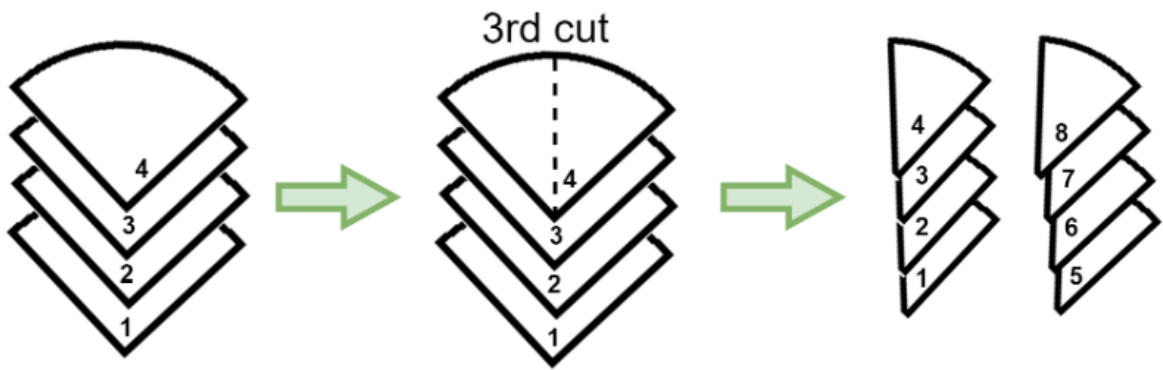
14. Ans 3.

Cut the cake into quarters (4 pieces) using 2 of the cuts – one horizontally down the centre of the cake and the other vertically down the centre of the cake. This will leave you with 4 pieces (or slices) of cake.



Step 2: Then take all 4 pieces and arrange them in a stack that is 4 pieces high.

Step 3: Finally, you can just cut that stack of 4 pieces in half – using your third and final cut – and then you will end up with 8 pieces of cake!



15. $3^3 + 3 + 3/3$ or $33 - 3 + 3/3$

16. 16.

In 1st column, $11 + 25 = 17 + 19$

In 2nd column, $6 + 34 = 12 + 28$

Similarly In the 3rd column, $8 + 19 = ? + 11$.

17. Both A and B are Rich.

There may be 4 conditions:

i) **Both A and B are rich** : A tells lie that B is a poor i.e. B is rich and B also tells lie that they are opposite types i.e. they are of the same type. This condition satisfies.

ii) Both A and B are poor

iii) A is poor and B is rich

iv) A is rich and B is poor

These conditions don't satisfy the problem.

18. After every **4th** Ravi's steps, his left leg will match with Akash's left leg.

19. 5

If there are two common faces and one of the common faces is in the same position, then the remaining faces are opposites of each other. so, when '1' is at the top, then 5 will be at the bottom.

20. (12, 348)

Based on AP series

$$A_n = A_1 + (n-1)d$$

$$51 = 7 + (n-1)4$$

So, $n=12$.

$$S_n = n/2\{2A_1 + (n-1)d\}$$

$$S_n = 12/2\{2*7 + (12-1)4\} = 348$$

So, the total journey is 348 miles in 12 days.

SURPRISE ROUND

1. Ans - 79 mangoes stole together

Assuming only 4 mangoes remained in the morning, this would mean that the third boy must have found 7 mangoes left when he woke up during the night. But 7 is not $\frac{2}{3}$ of a whole number, so this is impossible. As after the 2nd boy stole $\frac{1}{3}$ of the remainder, $\frac{2}{3}$ must be equal to 7 for the 3rd boy to find.

Now the next possibility is 10, which is $\frac{2}{3}$ of 15. This means that the third boy found 16 mangoes, took one and then took 5 more. The second boy then must have found 25 mangoes, taken one and then taken 8 more. But 25 is not $\frac{2}{3}$ of a whole number and, therefore, the assumption that 10 mangoes remained in the morning is absurd.

By similar reasoning the numbers 13, 16 and 19 can be eliminated, but 22 will be found to meet the required conditions.

The third boy found 34, took one and left $\frac{2}{3}$ of 33 or say 22, the second boy found 52, took one and left $\frac{2}{3}$ of 51 or 34, the first boy found 79 took one and left $\frac{2}{3}$ of 78 or 52.

The answer is the boys stole 79 mangoes.

2. $(3 \times 2) + 5 = 11$
 $(4 \times 3) + 2 = 14$
 $(5 \times 13) + 4 = 69$