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1 Numerical Manipulation I

Keynotes

1. Addition and Subtraction are commutative.
Example: 100 – 200 + 300
= 100 + 300 – 200
= 200.

2. Pair the numbers
Example : 102 + 104 + 106 + 108
= 2 × (102 + 108) = 2 × 210 = 420

3. Split the numbers
Example : 102 + 104 + 106 + 108
= 100 + 2 + 100 + 4 + 100 + 6 + 100 + 8
= 420.

Example 7:

Which of the following is correct?

(a) $\frac{11}{13} < \frac{13}{15}$

(b) $\frac{457}{912} < \frac{449}{899}$

(c) $\frac{16}{33} > \frac{20}{31}$

Solution:

(a) $\frac{11}{13} < \frac{13}{15}$ CORRECT

Difference between numerator and denominator of $\frac{11}{13}$ = 2

Difference between numerator and denominator of $\frac{13}{15}$ = 2

Therefore, $\frac{11}{13} < \frac{13}{15}$.

(b) $\frac{457}{912} < \frac{449}{899}$ WRONG

$\frac{457}{912} > \frac{1}{2}$ where $\frac{449}{899} < \frac{1}{2}$. Therefore, $\frac{457}{912} > \frac{449}{899}$.

(c) $\frac{16}{33} > \frac{20}{31}$ WRONG

$5 \times \frac{16}{33} = \frac{80}{33} < \frac{80}{31} = 4 \times \frac{20}{31}$

Since 5 groups of $\frac{16}{33}$ is less than 4 groups of $\frac{20}{31}$, then $\frac{16}{33} < \frac{20}{31}$.

Practice Questions

1. Given the sequence
0, 1, 3, 6, ___, 15, . . .

(a) Fill in the missing number.

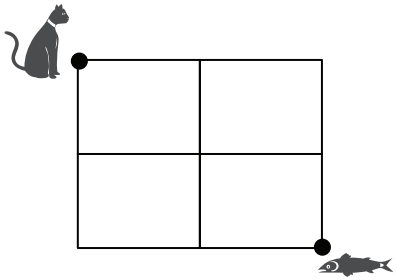
(b) Find the number in the 21st term.

2. Given the sequence
0, 6, 24, ___, 120, ___, 336, . . .
Fill in the missing numbers.

Examples

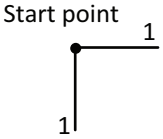
Example 1:

How many ways can the cat take to walk to the fish? (The cat can only walk straight to the right or downward.)

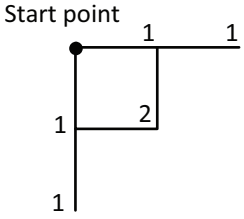


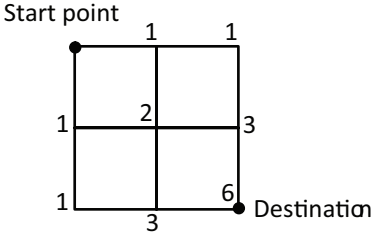
Solution:

1. From the start point to the next possible junction, count the number of way to reach this junction.



2. From the junction proceed to the next possible junction and count the number of way to reach this junction.





Number of ways = 6.