

Q. No. 1

(A) Sum of three consecutive ... numbers.

Solution:

Set of prime numbers = $\{2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, \dots\}$.

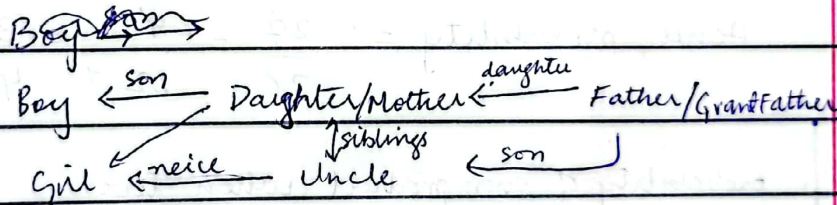
Sum of Consecutive Prime No.s = 97.

$$29 + 31 + 37 = 97.$$

Hence, the numbers are 29, 31, 37

(B) Introducing a boy and ... the girl?

Solution:



Either the boy is the girl's brother or first cousin: as per the given information.

Assuming Uncle to be on father's side, the boy is the girl's cousin

(c) Two dice are thrown. Is even?

Solution:

Probability = $\frac{\text{Possible outcomes of event}}{\text{Total outcomes}}$

Total outcomes

For two dice, ^{Total.} no. of outcomes = 6^n
 $= 6^2 = 36.$

outcomes where product is even:

(1,2), (1,4), (1,6), (2,1), (2,2), (2,3), (2,4),
(2,5), (2,6), (3,2), (3,4), (3,6), (4,1), (4,2),
(4,3), (4,4), (4,5), (4,6), (5,2), (5,4), (5,6),
(6,1), (6,2), (6,3), (6,4), (6,5), (6,6).

So, number of possible outcomes = 27.

Hence, probability = $\frac{27}{36} = \frac{3}{4}$

c. probability of even product when two dice are rolled simultaneously is $3/4$.

(D) A library has an avg. . . . Sunday is?

Solution:

Given:

Average no. of visitors = 510
on Sundays.

Avg. no. of visitors on other week days = 240.

Avg. no. of visitors visitors per day in

a 30 day month beginning with Sunday = ?

Solution:

Calculating no. of Sundays in this month:



$\therefore$ No. Sundays = 5.

& Other days = $6 + 6 + 6 + 6 + 1 = 25$.

Required avg. = $\frac{(\text{Avg. of Sunday Vis.} \times \text{No. of Sun}) + (\text{Avg. of other day Vis.} \times \text{No. of other days})}{\text{Total No. of days}}$

$$\begin{aligned} &= \frac{(510 \times 5) + (240 \times 25)}{30} \\ &= \frac{2550 + 6000}{30} \\ &= \frac{8550}{30} \\ &= 285 \end{aligned}$$

$\begin{array}{r} 240 \\ \times 25 \\ \hline 1200 \\ 4800 \\ \hline 6000 \end{array}$

$\therefore$ The avg. no. of visitors per day in a month of 30 days beginning with a Sunday is 285.

Q.No. 3

(A) A can do work . . . left is?

Given:

$$A's \text{ one day work} = \frac{1}{15}$$

$$B's \text{ one day work} = \frac{1}{20}$$

Fraction of work remaining after A & B
combine for 4 days = ?

Solution:

$$\text{Combined one day work} = \frac{1}{15} + \frac{1}{20}$$

$$= \frac{4 + 3}{60}$$

$$= \frac{7}{60}$$

$$\text{Work done in 4 days} = \frac{7}{60} \times 4 = \frac{28}{60}$$

$$= \frac{7}{15}$$

$$\text{Remaining work} = 1 - \frac{7}{15} = \frac{15-7}{15} = \frac{8}{15}$$

Hence, fraction of work remaining after A & B
combine for 4 days is $\boxed{\frac{8}{15}}$.

(B) Two numbers are in Ratio . . . is?

Solution:

let the two numbers be ~~4x and 5x~~ $3x$ and $5x$ (since ratio is 3:5).

After subtracting 9,

$$\frac{3x-9}{5x-9} = \frac{12}{23}$$

Solving above.

$$23(3x-9) = 12(5x-9)$$

$$69x - 207 = 60x - 108$$

$$69x - 60x = 207 - 108$$

$$9x = 99$$

$$x = 11$$

$\therefore$ the smallest number $3x = 3(11) = 33$.

Final answer = 33.

$$\begin{array}{r} 9 \\ 12 \overline{) 108} \\ \underline{108} \\ 0 \end{array}$$

(C) The avg. weight of A, B, C . . . of B is?

Given:

$$\text{Avg. wt. of A, B, \& C} = \frac{A+B+C}{3} = 45 \text{ kg.}$$

$$\text{Avg. wt. of A, B} = \frac{A+B}{2} = 40 \text{ kg.}$$

$$\text{Avg. wt. of B, C} = \frac{B+C}{2} = 43 \text{ kg.}$$

Weight of B = ?

Solution:

$$\text{since } \frac{A+B}{2} = 40 \text{ kg} \Rightarrow A = 80 - B.$$

$$\text{since } \frac{B+C}{2} = 43 \text{ kg} \Rightarrow C = 86 - B.$$

$$\text{therefore } \frac{A+B+C}{3} = 45 \text{ kg will become}$$

after putting values for A & C.

$$\frac{80 - B + B + 86 - B}{3} = 45 \text{ kg.}$$

$$-B + 166 = 45 \times 3$$

$$-B = 135 - 166$$

$$-B = -31$$

$$B = 31 \text{ kg.}$$

$\therefore$ weight of B = 31 kg.

(D) Find the missing terms.

$$1. \quad 2, 3, 6, 4, 5, 20, \underline{6}, 3, 18.$$

$$(2) \quad +1, \times 2, -2, +1, \times 4, \underline{\quad}.$$

$$2 \times 3 = 6, \quad 4 \times 5 = 20, \quad 11 \times 3 = 18.$$

$$\Rightarrow 2, 3, 6, 4, 5, 20, \boxed{6}, 3, 18$$

$$2. \ 1, 3, 9, 15, 25, \underline{35}, 49$$

$$1^2, 1 \times 3, 3^2, 3 \times 5, 5^2, \boxed{15 \times 7}, 7^2$$

$$1, 3, 9, 15, 25, \boxed{35}, 49$$

$$3. \ 2, 7, 10, 22, 18, 37, 26, \underline{52}$$

$$2, 7, \textcircled{2+8}, +15, 10+8, +15, 18+8, \textcircled{+15}$$

$$2, 7, 10, 22, 18, 37, 26, \boxed{37+15}$$

$$4. \ 34, 7, 37, 14, 40, 28, 43, \underline{56}$$

$$\textcircled{34}, 7, +3, \times 2, +3, \times 2, +3, \times 2$$

$$34, 7, 37, 14, 40, 28, 43, \boxed{56}$$

$$5. \ 5, 7, 11, \underline{13}, 17, 19$$

$$\textcircled{5}, +2, +4, \textcircled{+6}-4, -2, \textcircled{19}$$

$$5, 7, 11, \boxed{13}, 17, 19$$