

QNo:- 97 ,Correct Answer:- A

Explanation:- A travel $2\pi r = 60\pi$

B travel $2\pi r = 80\pi$

So LCM = 240π

That means A travel for 4 revolution and B travel for 3 revolution.

We need gap of 5000 revolution

So B will travel $5000 \times 240\pi$ cm distance in 45 min

So speed = $5000 \times 240\pi / 45$ cm / min

To convert cm into km

1 km = 1000m and 1 m = 100cm

So, 1 km = 100000cm,

So 1cm = 10^{-5} km

And 60 min = 1 hour

$$\text{So, speed} = 5000 \times 240\pi \frac{60}{45} \times \frac{1}{100000} = 16\pi$$

QNo:- 98 ,Correct Answer:- 3920

Explanation:- We want to go to (1, 1) to (8, 10) through (4, 6)

So, first we will go to (1, 1) to (4, 6) and then (4, 6) to (8, 10)

So from (1, 1) to (4, 6) we have $5 + 3 = 8$ ways = $\frac{8!}{5!3!} = 56$

And from (4, 6) to (8, 10) we have $4 + 4 = 8$ ways

So, $\frac{8!}{4!4!} = 70$

So, total $56 \times 70 = 3920$ ways

QNo:- 99 ,Correct Answer:- D

Explanation:- $2^{(19/2+4+3n)} \times 3^{(4+2m)} = 2^{(3/2+4m)} \times 3^{(n)}$

Comparing powers of 2 and 3 in LHS and RHS

$$3n + 12 = 4m$$

$$4m - 3n = 12$$

And

$$4 + 2m = n$$

$$2m - n = -4$$

Solving both

$$n = -20 \text{ and } m = -12$$

QNo:- 100 ,Correct Answer:- A

Explanation:- Population in 2019 = 1000

Population in 2020 = $1000 \times 2 + 3 = 2003 = (1003) \times 2 - 3$

Population in 2021 = $2 \times 2003 + 3 = 4009 = 4 \times (1003) - 3 = 2^2 (1003) - 3$

Population in 2022 = $2(4009) + 3 = 8021 = 8(1003) - 3 = 2^3 (1003) - 3$

\therefore we can see that population in 2034 is $2^{15} (1003) - 3$