

APTITUDE MCQ

Q1. At what time between 4:30 and 5:00 will the hands of a clock be at a right angle?

Sol. At 4:30 there is 45° space between hour and minute hands.

Every minute the minute hand moves 6° whereas the hour hand moves 0.5° .

Let after x minutes the hands are at right angle, then

$$6x - 0.5x = 90^\circ - 45^\circ$$

$$5.5x = 45$$

$$x = \frac{90}{11}$$

$$x = 8\frac{2}{11} \text{ minutes}$$

Q2. Evaluate the value of:

Sol.

$$x = \sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$$

$$x = \sqrt{6 + x}$$

$$x^2 - x - 6 = 0$$

$$x = -2, 3$$

As x cannot be negative

$$x = 3$$

Q3. Jack is playing a game in which he has 3 turns. In each of the three turns, the chances of winning are $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ respectively. What is the probability that Jack will win?

Sol.

$$P(\text{Jack winning}) = P(\text{Jack winning in first turn}) + P(\text{Jack winning in second turn}) + P(\text{Jack Winning in third turn})$$

$$P(\text{Jack Winning}) = \frac{1}{2} + \frac{1}{2} \times \frac{1}{3} + \frac{1}{2} \times \frac{2}{3} \times \frac{1}{4} = \frac{3}{4}$$

Q4. Find the next number in the sequence: 9, 16, 36, 64, 144, 196, 324, ____.

Sol. The sequence follows the pattern $(\text{Prime Number} + 1)^2$.

So the sequence is as follows:-

$$(2 + 1)^2, (3 + 1)^2, (5 + 1)^2, (7 + 1)^2, (11 + 1)^2, (13 + 1)^2, (17 + 1)^2, (19 + 1)^2$$

So the answer is 400.

Q5. Find the sum of the series till nth term:

$${}^nC_1 + 4 \cdot {}^nC_2 + 12 \cdot {}^nC_3 + 32 \cdot {}^nC_4 + \dots$$

Sol.

$$(1 + x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \dots$$

Differentiating both sides wrt x

$$n(1 + x)^{n-1} = \frac{n}{1!} + \frac{2n(n-1)x^1}{2!} + \frac{3n(n-1)(n-2)x^2}{3!} + \dots$$

Put x = 2

$$n(3)^{n-1} = \frac{n}{1!} + \frac{4n(n-1)}{2!} + \frac{12n(n-1)(n-2)}{3!} + \dots$$