



INSTITUTO FEDERAL

São Paulo

Câmpus Cubatão

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SALA: 317

MATEMATICA

SEMANA 9

$$① a) 4! = 4 \cdot 3 \cdot 2 = 24$$

$$b) 5! - 6! = 5! - 6 \cdot 5! = 5!(1-6) = 120 \cdot (-5) = -600$$

$$c) 9! = 9 \cdot 8 \cdot 7 \cdot 6! = 9 \cdot 8 \cdot 7 = 504$$

$$d) \frac{98!}{100!} = \frac{98!}{100 \cdot 99 \cdot 98!} = \frac{1}{9900}$$

$$② \frac{1}{n!} - \frac{n}{(n+1)!}$$

$$\frac{1}{n!} - \frac{n}{(n+1)n!}$$

$$\frac{n+1 - n}{(n+1)n!}$$

$$\frac{1}{(n+1)!}$$

$\mathcal{R}:(A)$

$$③ \frac{(n!)^2 - (n-1)! \cdot n!}{(n-1)! \cdot n!} \rightarrow \frac{(n!)^2 - (n-1)! \cdot n!}{(n-1)! \cdot n!} = \frac{n! - (n-1)!}{(n-1)!}$$

$$\frac{n(n-1)! - (n-1)!}{(n-1)!} = \frac{n-1}{(n-1)!} = n-1$$

$\mathcal{R}:(A)$

$$④ \frac{(n+2)!}{(n+1)!} \cdot \frac{(n-2)!}{(n-1)!} = 4$$

$$\frac{(n+2)!}{(n+1)!} \cdot \frac{(n-2)!}{(n-1)!} = 4 \rightarrow$$

$$\frac{(n+2) \cdot (n+1)!}{n+1} \cdot \frac{(n-2)!}{(n-1) \cdot (n-2)!} = 4 \rightarrow \frac{(n+2)}{(n-1)} = 4 \rightarrow$$

$$n+2 = 4(n-1) \rightarrow n+2 = 4n-4 \rightarrow 4n-n-2 = 4 \rightarrow 3n-2 = 4 \rightarrow 3n = 6 \rightarrow$$

$$n = \frac{6}{3} = 2 \rightarrow \text{par} \quad \mathcal{R}:(A)$$

$$\textcircled{5} \frac{(n+1)!}{(n+1)!} - \frac{n!}{n!} = 7 \rightarrow \frac{(n+1) \cdot n!}{(n+1)!} - \frac{n!}{n!} = 7 \rightarrow$$

$$\cancel{n!} \frac{(n+1-1)}{(n+1)!} = 7 \rightarrow \frac{n+1}{n+1} = 7 \rightarrow n = 7 \rightarrow n = 7$$

$$R_2(D)$$

$$\textcircled{6} n \in \mathbb{N}, n \geq 1 = (n-1)! \cdot [(n+1)! - n!]$$

$$\downarrow$$

$$(n-1)! \cdot [(n+1)! - n!]$$

$$(n-1)! \cdot [n! \cdot (n+1) - n!]$$

$$(n-1)! \cdot (n! \cdot n)$$

$$[n(n-1)!] \cdot [n!]$$

$$(n!) \cdot (n!) = (n!)^2$$

$$R_2(D)$$

$$\textcircled{7} \frac{n! + (n-1)!}{(n+1)! - n!} = 6$$

$$\frac{n(n-1)! + (n-1)!}{(n+1)n! - n!} = 6$$

$$\frac{(n-1)! [n+1]}{n! [(n+1) - 1]} = 6$$

$$\frac{(n-1)! [n+1]}{n! [n]} = 6$$

$$\frac{n(n-1)! [(n+1)-1]}{n!} = 6$$

$$\frac{n+1}{n^2} = 6$$

$$6n^2 = 25(n+1)$$

$$6n^2 = 25n + 25$$

$$6n^2 - 25n - 25 = 0$$

$$\Delta = (-25)^2 - 4 \cdot 6 \cdot 25$$

$$\Delta = 625 - 600$$

$$\Delta = 25$$

$$n = \frac{25 \pm \sqrt{25}}{2 \cdot 6}$$

$$n_1 = \frac{25 + 5}{2 \cdot 6} = \frac{30}{12} = 5$$

$R_2(C)$

$$n_2 = \frac{25 - 5}{2 \cdot 6} = \frac{20}{12} = \frac{5}{3} \leftarrow \text{Inválido}$$

DM	SEG	TER	QUA	QUI	SEX	SAB
DM	LUN	MAR	MIE	IUE	VIE	SAB
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⑧ 21! - 221

21! = 510909421717094 ^{3/977} ~~10000~~
 - 221

51090942171709439779
 7

R:(D)