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Relations and Functions Formulas

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List of 15 Relations and Functions Formulas

Relations and Functions

Functions

1) Number of Bijective Functions from Set A to Set B

$$\text{fx } N_{\text{Bijective Functions}} = n_{(A)}!$$

Open Calculator 

$$\text{ex } 6 = 3!$$

2) Number of Functions from Set A to Set B

$$\text{fx } N_{\text{Functions}} = (n_{(B)})^{n_{(A)}}$$

Open Calculator 

$$\text{ex } 64 = (4)^3$$

3) Number of Injective (One to One) Functions from Set A to Set B

$$\text{fx } N_{\text{Injective Functions}} = \frac{n_{(B)}!}{(n_{(B)} - n_{(A)})!}$$

Open Calculator 

$$\text{ex } 24 = \frac{4!}{(4 - 3)!}$$



4) Number of Relations from Set A to Set B which are not Functions

$$\text{fx } N_{\text{Relations not Functions}} = 2^{n(A) \cdot n(B)} - (n(B))^{n(A)}$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

$$\text{ex } 4032 = 2^{3 \cdot 4} - (4)^3$$

Relations

5) Number of Antisymmetric Relations on Set A

$$\text{fx } N_{\text{Antisymmetric Relations}} = 2^{n(A)} \cdot 3^{\frac{n(A) \cdot (n(A) - 1)}{2}}$$

[Open Calculator !\[\]\(5361750c22c4e047a52f4eac1ec2d4cc_img.jpg\)](#)

$$\text{ex } 216 = 2^3 \cdot 3^{\frac{3 \cdot (3-1)}{2}}$$

6) Number of Asymmetric Relations on Set A

$$\text{fx } N_{\text{Asymmetric Relations}} = 3^{\frac{n(A) \cdot (n(A) - 1)}{2}}$$

[Open Calculator !\[\]\(b792654f2cef9719eabeb6c5be00811e_img.jpg\)](#)

$$\text{ex } 27 = 3^{\frac{3 \cdot (3-1)}{2}}$$

7) Number of Irreflexive Relations on Set A

$$\text{fx } N_{\text{Irreflexive Relations}} = 2^{n(A) \cdot (n(A) - 1)}$$

[Open Calculator !\[\]\(84f47badaad7772cd95667a7c387a639_img.jpg\)](#)

$$\text{ex } 64 = 2^{3 \cdot (3-1)}$$



8) Number of Non Empty Relations from Set A to Set B 

$$fx \quad N_{\text{Non Empty Relations}} = 2^{n(A) \cdot n(B)} - 1$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$ex \quad 4095 = 2^{3 \cdot 4} - 1$$

9) Number of Reflexive Relations on Set A 

$$fx \quad N_{\text{Reflexive Relations}} = 2^{n(A) \cdot (n(A) - 1)}$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$ex \quad 64 = 2^{3 \cdot (3-1)}$$

10) Number of Relations from Set A to Set B 

$$fx \quad N_{\text{Relations(A-B)}} = 2^{n(A) \cdot n(B)}$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)


$$ex \quad 4096 = 2^{3 \cdot 4}$$

11) Number of Relations on Set A 

$$fx \quad N_{\text{Relations(A)}} = 2^{n(A)^2}$$

[Open Calculator !\[\]\(899d8b7697d64725bf017d3296cfcf1b_img.jpg\)](#)

$$ex \quad 512 = 2^{(3)^2}$$

12) Number of Relations on Set A which are both Reflexive and Antisymmetric 

$$fx \quad N_{\text{Reflexive \& Antisymmetric}} = 3^{\frac{n(A) \cdot (n(A) - 1)}{2}}$$

[Open Calculator !\[\]\(40770d9ed6ed4f1222ebf89a1396e8b2_img.jpg\)](#)

$$ex \quad 27 = 3^{\frac{3 \cdot (3-1)}{2}}$$



13) Number of Relations on Set A which are both Reflexive and Symmetric

$$\text{fx } N_{\text{Reflexive \& Symmetric}} = 2^{\frac{n(A) \cdot (n(A)-1)}{2}}$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)](#)

$$\text{ex } 8 = 2^{\frac{3 \cdot (3-1)}{2}}$$

14) Number of Relations on Set A which are both Symmetric and Antisymmetric

$$\text{fx } N_{\text{Symmetric \& Antisymmetric}} = 2^{n(A)}$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)

$$\text{ex } 8 = 2^3$$

15) Number of Symmetric Relations on Set A

$$\text{fx } N_{\text{Symmetric Relations}} = 2^{\frac{n(A) \cdot (n(A)+1)}{2}}$$

[Open Calculator !\[\]\(bd3b31712ad9bab5a241210fa6925cdd_img.jpg\)](#)

$$\text{ex } 64 = 2^{\frac{3 \cdot (3+1)}{2}}$$



Variables Used

- $n_{(A)}$ Number of Elements in Set A
- $n_{(B)}$ Number of Elements in Set B
- $N_{\text{Antisymmetric Relations}}$ No. of Antisymmetric Relations on A
- $N_{\text{Asymmetric Relations}}$ Number of Asymmetric Relations
- $N_{\text{Bijective Functions}}$ Number of Bijective Functions from A to B
- $N_{\text{Functions}}$ Number of Functions from A to B
- $N_{\text{Injective Functions}}$ Number of Injective Functions from A to B
- $N_{\text{Irreflexive Relations}}$ Number of Irreflexive Relations
- $N_{\text{Non Empty Relations}}$ Number of Non Empty Relations from A to B
- $N_{\text{Reflexive \& Antisymmetric}}$ No. of Reflexive and Antisymmetric Relations on A
- $N_{\text{Reflexive \& Symmetric}}$ No. of Reflexive and Symmetric Relations on A
- $N_{\text{Reflexive Relations}}$ Number of Reflexive Relations on Set A
- $N_{\text{Relations not Functions}}$ No. of Relations A to B which are not Functions
- $N_{\text{Relations(A)}}$ Number of Relations on A
- $N_{\text{Relations(A-B)}}$ Number of Relations from A to B
- $N_{\text{Symmetric \& Antisymmetric}}$ No. of Symmetric and Antisymmetric Relations on A
- $N_{\text{Symmetric Relations}}$ Number of Symmetric Relations on Set A



Constants, Functions, Measurements used



Check other formula lists

- [Relations and Functions Formulas](#) 
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