

Name .....

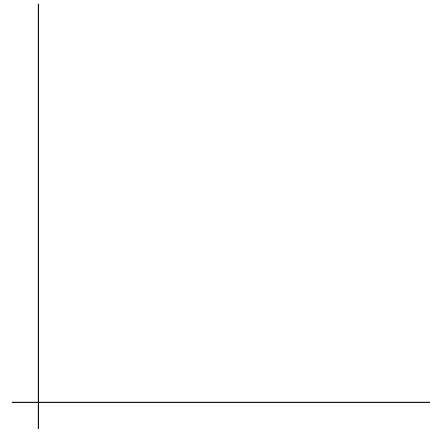
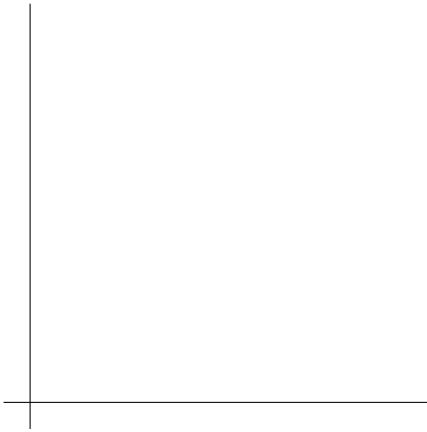
BA 1 2 row .... col....

1.	2.	3.	$\Sigma$

1. For  $X_{a,b} = \{(x, y) \in \mathbb{R}_+^2 : y > a(x - b) + b^2\}$  where  $a, b \in \mathbb{R}$ . Find:

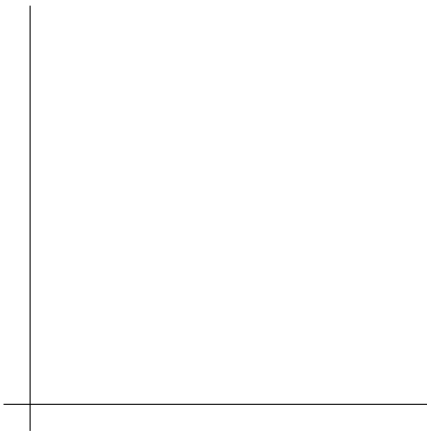
$$\bigcap_{a < 0} X_{a,b}$$

$$\bigcup_{b > 0} \bigcap_{a < 0} X_{a,b}$$

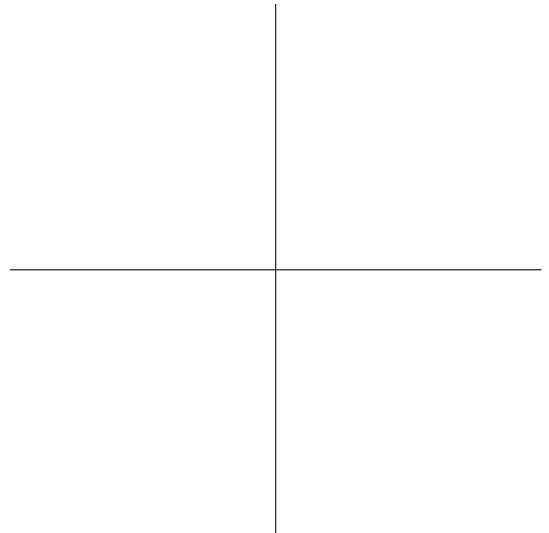


$$\bigcap_{a > 0} X_{a,b}$$

$$\bigcup_{b > 0} \bigcap_{a > 0} X_{a,b}$$



2. Find  $f(A)$  and  $f^{-1}(f(A))$  for  $A = [-2, 2] \times [1, 2]$  and  $f : \mathbb{R}^2 \rightarrow \mathbb{R}$ ,  $f(x, y) = \frac{1}{(x+y)^2+1}$



3. Are given relations functions? For functions find their domain and settle if they are one-to-one functions ?  $x, y, z \in \mathbb{R}$ .

$$(x, y)Rz \Leftrightarrow z^2 + x^2y^2 = 4xy$$

$$(x, y)Sz \Leftrightarrow 4z^2 + 4x^2y^2 = xyz$$

$$(x, y)Tz \Leftrightarrow e^z = \ln x^2y^2$$

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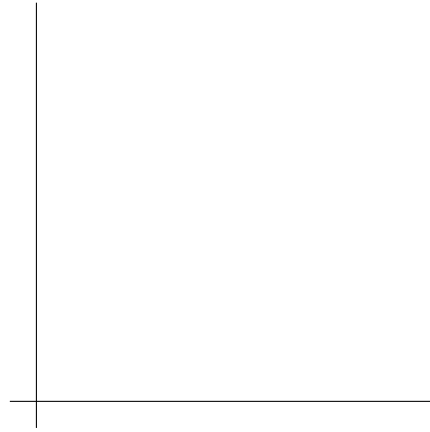
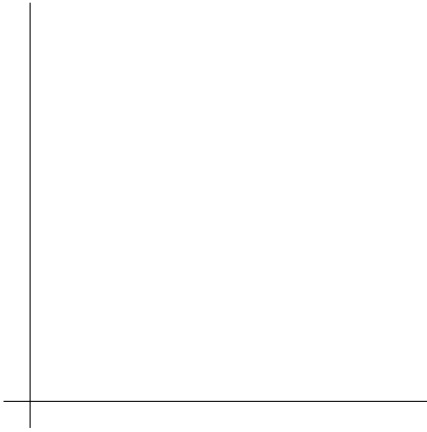
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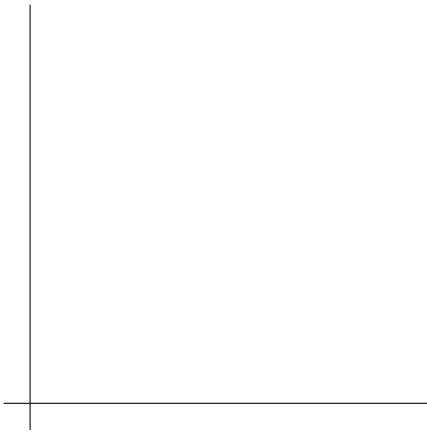
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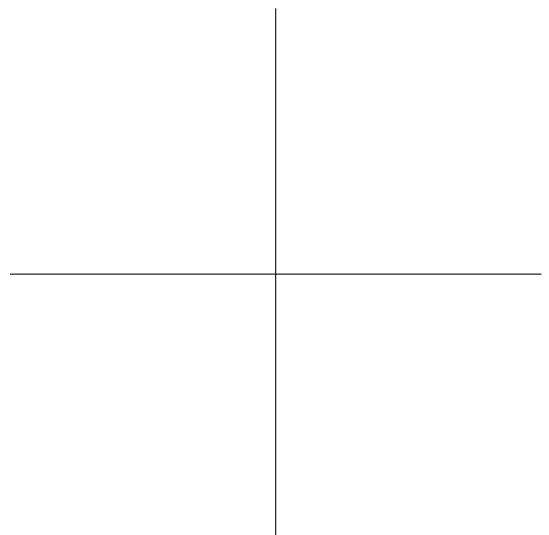
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