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1st Year License
Geology
Mathematics 01

Serie of T.D N ° 1 (S1)

Exercice 1

complete with symbols $\in$ ou $\notin$:

1. $\sqrt{2}\cdots\cdots\left]0\ ;\ 1{,}414\right]$
2. $\sqrt{3}\cdots\cdots\left[1{,}732\ ;\ 5\right]$
3. $0{,}99\cdots\cdots\left]0\ ;\ 1\right[$
4. $10{,}01\cdots\cdots\left]10^{-1}\ ;\ 10^{1}\right]$
5. $\pi\cdots\cdots\left]0\ ;\ 3{,}14\right]$
6. $-2\cdots\cdots\left]-2{,}1\ ;\ 2\right]$

Exercice 2

specify the smallest set, in the sense of inclusion, to which the following numbers belong:

1. $A=\left(\frac{1}{\sqrt{3}}\right)^2$;
2. $B=\frac{\sqrt{3}-\sqrt{12}}{\sqrt{3}}$;
3. $C=-\sqrt{2}\times\sqrt{8}$;
4. $D=\frac{1}{1+\sqrt{3}}+\frac{1}{1-\sqrt{3}}$;
5. $E=\left(1-\sqrt{2}\right)^2+\sqrt{8}$;

Exercice 3

Determine and simplify the following sets:

1. $\left]-\infty\ ;\ 8\right]\cup\left]-3\ ;\ 10\right]=\ldots\ldots$
2. $\left]-\infty\ ;\ 8\right]\cap\left]-3\ ;\ 10\right]=\ldots\ldots$
3. $\left]-\infty\ ;\ 8\right]\cup\left[1\ ;\ +\infty\right[=\ldots\ldots$
4. $\left]-\infty\ ;\ 8\right]\cap\left[1\ ;\ +\infty\right[=\ldots\ldots$
5. A est l'ensemble des réels x tels que : $x>2$ et $x\leq 5$ alors $A=\ldots\ldots$
6. B est l'ensemble des réels x tels que : $x<0$ et $x\geq -5$ alors $B=\ldots\ldots$

Exercice 4

Copy the table below then compare $|x|+|y|$ et $|x+y|$:

x	y	$\lvert x\rvert$	$\lvert y\rvert$	$\lvert x\rvert+\lvert y\rvert$	$\lvert x+y\rvert$
1	-5				
-6	2				
2	6				
-3	-3				

Exercice 5

complete the table below:

Encadrement	Intervalle	Centre	Rayon	Distance	Valeur absolue
$3<x<9$	$x\in\ ]3\ ;\ 9[$	6	3	$d(x\ ;\ 6)<3$	$\lvert x-6\rvert<3$
$-3<x<7$					
				$d(x\ ;-1)\leq 0{,}1$	
					$\lvert x+2\rvert<\frac{1}{2}$
				$d(x\ ;\ 2)>4$	
	$x\in[-1\ ;\ 5]$				
$x\leq -2$ ou $x>6$					
					$\lvert -x-1\rvert>2$

Exercice 6

Solve :

1. $|x-1|=1$
2. $|x-3|=2$
3. $|x-2|\leq 5$
4. $|x+4|\leq 1$
5. $|x+5|=|x+1|$
6. $|x-1|+|x-2|=2$

Exercice 7

For each of the following statements, say whether it is true or false. If false, indicate why

Affirmation 1 : $\left\{-2;3;\frac{10}{3}\right\}\subset\mathbb{Z}$. .....

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Affirmation 2 : $\left\{-2;3;\frac{12}{3}\right\}\subset\mathbb{Z}$ .....

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Affirmation 3 : $\{-2;\sqrt{2};\sqrt{9}\}\subset\mathbb{Z}$ .....

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Exercice 8

If a and b are positive real numbers or z ero, show that

1. $\sqrt{a}+\sqrt{b}\leq\sqrt{2}\sqrt{a+b}$
2. $\frac{2}{\frac{1}{a}+\frac{1}{b}}\leq\sqrt{ab}$