GLOBAL TEST - 4º ESO

Exercise 1: Solve: $\left.\begin{array}{l} 2x-y=7 \\ x^2+2y^2=43 \end{array}\right\} \rightarrow$ $\boxed{\begin{array}{ll} x=5 & y=3 \\ x=11/9 & y=-41/9 \end{array}}$

Exercise 2: Solve: $\left.\begin{array}{l} x^2-5x+4>0 \\ 4-x^2\geq 0 \end{array}\right\} \rightarrow$ $\boxed{x\in[-2,1)}$

Exercise 3: Find the domain of the following functions:

a) $f(x)=\dfrac{x^3-4x^2+8}{x^2+x-6}$ $\quad\boxed{\text{Dom } f=\mathbb{R}-\{-3,2\}}$

b) $f(x)=\dfrac{2}{\sqrt{x-5}}$ $\quad\boxed{\text{Dom } f=(5,+\infty)}$

Exercise 4: Work out:

a) $\lim\limits_{x\to 5}\dfrac{x^2-2x-15}{x^2-25}=\dfrac{4}{5}$

b) $\lim\limits_{x\to\infty}\left(\dfrac{x^2+7x}{x-2}-x\right)=9$

Exercise 5: Work out: $\log_5\dfrac{\sqrt{125}\cdot\sqrt[3]{625}}{\sqrt[7]{5}}=\dfrac{113}{42}$

Exercise 6: If $\tan\alpha=2.15$ and $\pi<\alpha<\dfrac{3\pi}{2}$ find the values of $\cos\alpha$, $\sin\alpha$ and the angle α

$\boxed{\cos\alpha=-0.42}$ $\quad\boxed{\tan\alpha=-0.91}$ $\quad\boxed{\alpha=245.06^\circ}$

Exercise 7: Given the vectors $\vec{u}=(-3,5)$, $\vec{v}=(2,5)$ and $\vec{w}=(3,20)$ write $\vec{w}$ as a linear combination of $\vec{u}$ and $\vec{v}$ $\quad\boxed{\vec{w}=\vec{u}+3\vec{v}}$

Exercise 8: Find the parametric, continuous and general equations of the straight line that goes through the points $A(5,-1)$ and $B(8,3)$

$\begin{cases} x=5+3t \\ y=-1+4t \end{cases}$ $\quad\dfrac{x-5}{3}=\dfrac{y+1}{4}$ $\quad 4x-3y-23=0$

Exercise 9: 85% of my students decided to get a calculator from a known brand, while the rest bought theirs at a five-and-dime store. When falling to the ground, 2% of the quality calculators and 27% of the cheap ones stop working. Taking a random calculator from one of my students find the probability that:

a) It is a cheap one and it will break if it crashes against the floor 0.0405

b) They have a good quality calculator, knowing that it flew out of my hands and still works 0.8838

Exercise 10: Given two events A and B so that $P(A)=0.65$, $P(\overline{B})=0.3$ and $P(A\cap B)=0.4$

a) $P(A\cup B)=0.95$

b) $P(A/B)=0.5714$

c) Are A and B independent events? Why? Nope, they are not independent