Bareme grade 10 mid year

2013-2014

Nº		Solution	Note
I	1	$\lvert x^2-5\rvert = -3$……(a)	1
	2	[-5 , 1]$\cap$X= [-3 , 1] , then X could be [-3, +3[……..(a)	1
	3	$\cos(x+\frac{5\pi}{2}) = \cos(x+\frac{\pi}{2}+2\pi) = \cos(x+\frac{\pi}{2}) = -\sin x$ $\sin x = \frac{\sqrt{3}}{3}\times\frac{\sqrt{3}}{\sqrt{3}} = \frac{1}{\sqrt{3}}$ so ………..(b)	1
	4	$\frac{\sqrt[4]{x^4}}{\sqrt[3]{x^3}} = \frac{-x}{x} = -1$ ……………….(b)	1
II	1	A = {-4,1,4} & B = { 0,1,2,3}	1.5
	2	A$\cap B$ = {1} A$\cup$ B = {-4,0,1,2,3,4 }	0.5
	3-i	$\in$	0.25
	3-ii	$\subset$	0.25
III		$x\in\left]-1,+\infty\right[$	1
		$x\in\left]-\infty,-4\right[\cup\left[-1,\frac{5}{2}\right[$	1.5
		S= $\left]-1,+\infty\right[\cap \left(\left]-\infty,-4\right[\cup\left[-1,\frac{5}{2}\right[\right) = \left]-1,\frac{5}{2}\right]$	0.5
IV	1	$3\le x\le 4$ $6\le 2x\le 8$ $5\le 2x-1\le 7$ $9\le x^2\le 16$ $-2\le y\le -1$ $1\le y^2\le 4$ $10\le x^2+y^2\le 20$ $\frac{1}{20}\le\frac{1}{x^2+y^2}\le\frac{1}{10}$ $\frac{1}{4}\le\frac{2x-1}{x^2+y^2}\le\frac{7}{10}$	1.5
	2-a	$\frac{9^{\frac{2}{5}}\times 6^{\frac{3}{5}}}{\sqrt[5]{9}\times\sqrt[5]{2^3}\times\sqrt[5]{3^3}} = \frac{3^{\frac{4}{5}}\times 2^{\frac{3}{5}}\times 3^{\frac{3}{5}}}{3^{\frac{2}{5}}\times 2^{\frac{3}{5}}\times 3^{\frac{3}{5}}} = 3^{\frac{2}{5}}$	1.5
	2-b	$\sqrt{(\sqrt{7}-3)^2}+\sqrt[3]{(2\sqrt{7}-5)^3}-\lvert 2-\sqrt{7}\rvert = 3-\sqrt{7}+2\sqrt{7}-5-\left(\sqrt{7}-2\right)=0$	1.5

V		$\sin(7\pi - x) - \cos(-9\pi - x) - \cos\left(\frac{9\pi}{2} - x\right) + \tan\left(\frac{14\pi}{2} + x\right)$ $\sin(\pi - x) - \cos(-\pi - x) - \cos(\frac{\pi}{2} - x) + \tan x = \sin x + \cos x - \sin x + \tan x = \cos x + \tan x$	2.25
	2	$tan^2x - sin^2x = \frac{\sin^2 x}{\cos^2 x} - \sin^2 x = \sin^2 x\left(\frac{1}{\cos^2 x} - 1\right) = \sin^2 x.\tan^2 x$	1
	3	$\cos^2 31^\circ + \cos^2 59^\circ - \cos^2 120^\circ$ (31+59 = 90) $\cos^2(90-59) + \cos^2 59^\circ - \cos^2(180-60) = \sin^2 59 + \cos^2 59^\circ - \cos^2 60 = 1 + 0.5 = 1.5$	1.25
	4-a	$(\sin x + \cos x)^2 = \sin^2 x + \cos^2 x + 2\sin x.\cos x = 1 + 2\sin x\cos x$ $\sin x.\cos x = \frac{1}{8}$	1
	4-b	$\frac{1}{\sin x} + \frac{1}{\cos x} = \frac{\cos x + \sin x}{\sin x.\cos x} = \frac{-\sqrt{\frac{5}{4}}}{\frac{1}{8}} = -4\sqrt{5}$ since for $x \in [\pi, \frac{3\pi}{2}]$ sinx and cosx are both negative	1
VI	1	$\vec{V}(-2,21)$	1
	2	$\overrightarrow{AB}(-4,-3)$ $\overrightarrow{AC}(-2,-9)$ $\Rightarrow \det(\overrightarrow{AB}, \overrightarrow{AC}) = 36 - 5 = 31 \neq 0 \Rightarrow$ A,B & C are not collinear	1.5
	3-a	$2x + 1 = \frac{2-2+0}{3} = \frac{0}{3} = 0 \Rightarrow x = \frac{-1}{2}$ $2y + 4 = \frac{5+2-4}{3} = \frac{3}{3} = 1 \Rightarrow 2y = -3 \Rightarrow y = \frac{-3}{2}$	1
	3-b	$\frac{2x-1}{-12} = \frac{2y-1}{-9} \Rightarrow 6x - 8y + 1 = 0$	1
	4	B(-2, 6)	1
VII	1	Figure	
	2	$\overrightarrow{JK} = \overrightarrow{JI} + \overrightarrow{IK} = -\frac{1}{2}\overrightarrow{IA} - \overrightarrow{IB}$	1
	3-a	$2\overrightarrow{LA} + \overrightarrow{LB} = \vec{0}$ $2\overrightarrow{LA} + \overrightarrow{LA} + \overrightarrow{AB} = 0$ $3\overrightarrow{LA} = -\overrightarrow{AB}$ $\Rightarrow \overrightarrow{AL} = \frac{1}{3}\overrightarrow{AB}$ + position of L	1
	3-b	$\overrightarrow{JL} = \overrightarrow{JI} + \overrightarrow{IA} + \overrightarrow{AL} = \frac{1}{2}\overrightarrow{AI} - \overrightarrow{AI} + \frac{1}{3}\overrightarrow{AI} + \frac{1}{3}\overrightarrow{IB} = \frac{1}{6}\overrightarrow{IA} + \frac{1}{3}\overrightarrow{IB}$	1.5
	3-c	$\overrightarrow{JL} = \frac{1}{6}\overrightarrow{IA} + \frac{1}{3}\overrightarrow{IB} = \frac{1}{3}\left(\frac{1}{2}\overrightarrow{IA} + \overrightarrow{IB}\right) = \frac{1}{3}\left(-\overrightarrow{JK}\right) = \frac{-1}{3}\overrightarrow{JK}$	0.5