

نموذج (٢) لامتحان شهادة إتمام الدراسة الثانوية العامة ٢٠٢٥ / ٢٠٢٦ م

المادة : الرياضيات البحتة باللغة الإنجليزية (الشعبة العلمية رياضيات) الزمن : ساعتان

First: Multiple choice questions” one mark for each item”

(1)	If $Z_1 = 2 + 2\sqrt{3}i$, $Z_2 = -3 - 3\sqrt{3}i$, then the principle amplitude of the complex number $Z_1 + Z_2 = \dots\dots\dots$						
(a)	$\frac{\pi}{3}$	(b)	$\frac{2\pi}{3}$	(c)	$\frac{-5\pi}{6}$	(d)	$\frac{-2\pi}{3}$
(2)	In the expansion of $\left(\sqrt{x} + \frac{1}{x}\right)^{60}$ the value of the term free of x equals						
(a)	2^{60}	(b)	${}^{60}C_{21}$	(c)	${}^{60}C_{20}$	(d)	there is no term free of x in the expansion
(3)	ABC is a triangle in which A (1 , 3 , 3) , B (0 , 1 , 2) , C (5 , 7 , 1) , If D is the midpoint of $\overline{AC}$, then $\ \overrightarrow{BD}\ = \dots\dots\dots$						
(a)	5	(b)	$4\sqrt{5}$	(c)	$3\sqrt{5}$	(d)	6
(4)	If $2ye^x = 3e^2$, then $\frac{dy}{dx} = \dots\dots\dots$						
(a)	$\frac{-1}{2}y$	(b)	$\frac{3}{2}y$	(c)	$-y$	(d)	y
(5)	$\int (1 + \tan^2 x) \cos^2 x \, dx = \dots\dots\dots + c$						
(a)	1	(b)	x	(c)	$\frac{1}{2} \sec^2 x$	(d)	$\frac{1}{3} \sec^3 x$
(6)	The measure of the angle between the straight lines $\vec{r} = (1, 2, 3) + t(9, 4, -2)$ and the plane $3x + 4y + 5z = 60$ equals to the nearest degree.						
(a)	28°	(b)	62°	(c)	90°	(d)	128°

(7)	The coefficient of the fifth term in the expansion $(1 + 2x)^{10}$ according to the ascending powers of x equals						
(a)	$16 \times {}^{10}C_5$	(b)	$\frac{1}{16} \times {}^{10}C_5$	(c)	$\frac{1}{16} \times {}^{10}C_4$	(d)	$16 \times {}^{10}C_4$
(8)	If $f(x) = \int (1 + \cos 2x) dx$ and $f(\pi) = 2\pi$, then $f(-\pi) = \dots\dots\dots$						
(a)	-1	(b)	zero	(c)	1	(d)	2

(9)	The volume of the solid generated by revolving the region bounded by the curve $y = \sqrt{x}$ and the lines $x = 0, x = 1$ a complete revolution about x – axis equals						
(a)	$\frac{1}{2} \pi$	(b)	$\frac{1}{5} \pi$	(c)	$\frac{3}{10} \pi$	(d)	$\frac{7}{10} \pi$
(10)	If $f(x) = 6^{\log_6(x^2+8)}$, then the point						
(a)	(0 ,8) is a local minimum			(b)	(0 ,8) is a local maximum		
(c)	(0 ,6) is a local minimum			(d)	(0 ,8) is an inflection point		

Second: Multiple choice questions” two marks for each item:

(11)	If the straight line $L_1 : \frac{x}{-8} = \frac{y}{5} = \frac{z}{2}$ is perpendicular to the straight line $L_2 : \frac{x+1}{2} = \frac{y-1}{k} = \frac{z-3}{m}$, then $5k + 2m = \dots\dots$						
(a)	16	(b)	8	(c)	- 8	(d)	- 12

(12)	If the function $f(x) = \begin{cases} x^2 + 4 & , \quad x < 2 \\ 30 - 11x & , \quad x \geq 2 \end{cases}$ is continuous on $\mathbb{R}$, then $\int_0^6 f(x) dx = \dots\dots\dots$						
(a)	136	(b)	68	(c)	$\frac{-136}{3}$	(d)	- 68

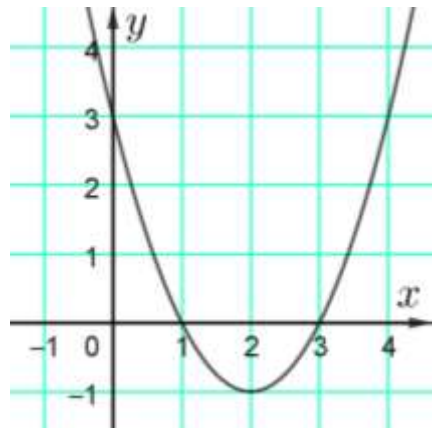
(13)	If the straight line $x = \frac{1}{2}y = z$ is parallel to the plane $x + 2y + az + 5 = 0$, then a =...							
(a)	- 2	(b)	- 3	(c)	- 4	(d)	- 5	

(14)	If the equation of the straight line L_1 is $\vec{r}_1 = (4, 3, 1) + t(-2, 1, 3)$ and the equation of the straight line L_2 is $\vec{r}_2 = (5, 1, 1) + t(2, -1, -3)$, then the equation of the plane contains them is						
(a)	$x + y + z = 12$	(b)	$x + 2y + z = 12$	(c)	$2x + y + z = 12$	(d)	$x + y + 2z = 12$

(15)	If $x = \sin(2z)$, $y = \cos(2z)$,then $\frac{d^2y}{dx^2} = \dots\dots\dots$ at $z = \frac{\pi}{2}$						
(a)	- 1	(b)	1	(c)	zero	(d)	- 2

(16)	If $f(x)=(x-4) x $, $x \in [1, 4]$, then the absolute minimum value =						
(a)	- 5	(b)	- 4	(c)	- 3	(d)	0

(17)	In the expansion of $(1 + c x)^{10}$ according to the ascending powers of x , if the coefficient of the third term is 180, then $c = \dots\dots$						
(a)	± 1	(b)	± 2	(c)	± 3	(d)	$\pm \sqrt{2}$

(18)	If the opposite figure represents the curve of $f'(x)$, then the curve of $f(x)$ is convex upwards when $x \in \dots\dots\dots$						
(a)	$] -\infty, 2[$	(b)	$] 2, \infty [$	(c)	$] 1, \infty [$	(d)	$\mathbb{R}$

Third: essay questions “two marks for each question:

(19)	If $Z = 1 + \sqrt{3}i^n$, $ Z = 8$ find the principle amplitude of the complex number Z.
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(20)	If $f(x) = \ln(x + 5\ln x)$ find the slope of the tangent of the curve of $f(x)$ at $x = 1$.
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