

نموذج (٤) 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)	The principal amplitude of the complex number $z = 3(\sin 30^\circ - i \cos 30^\circ)$ is						
(a)	$\frac{-\pi}{2}$	(b)	$\frac{-\pi}{3}$	(c)	$\frac{-\pi}{4}$	(d)	$\frac{-\pi}{6}$
(2)	In the expansion of $\left(\frac{3}{x^2} + 4x\right)^{12}$, the term free of x is.....						
(a)	T_3	(b)	T_5	(c)	T_7	(d)	T_9
(3)	If A (-2 , k ,1) , $\ \vec{A}\ = 3$, then the value of K =.....						
(a)	± 1	(b)	± 2	(c)	± 3	(d)	± 4
(4)	If $f(x) = 3 \ln x$, then $f'(3) = \dots\dots\dots$						
(a)	zero	(b)	1	(c)	$\ln 3$	(d)	$3 \ln 3$
(5)	If $f''(x) = \frac{1}{2}(e^x + e^{-x})$ and $f(0) = 1, f'(0) = 0$, then $f(x) = \dots\dots\dots$						
(a)	$-f'(x)$	(b)	$f'(x)$	(c)	$-f''(x)$	(d)	$f''(x)$
(6)	The measure of the angle between the line: $\frac{x-1}{2} = \frac{y+3}{-1} = \frac{z}{3}$ and the plane $3x + 2y + z = 8$ equal						
(a)	30°	(b)	45°	(c)	60°	(d)	90°
(7)	The coefficient of x^4 in the expansion $x^3 \left(x + \frac{1}{x}\right)^7$ is						
(a)	7C_3	(b)	7C_1	(c)	${}^{10}C_4$	(d)	${}^{10}C_3$

(8)	If the slope of the tangent to the curve at any point (x, y) is $\frac{3x+2}{x}$ and $f(e) = 3e + 5$, then the equation of the curve is : $y = \dots\dots\dots$			
(a)	$3x + 3 \ln x + 3$	(b)	$3x + 3 \ln x + 5$	
(c)	$3x + 2 \ln x + 3$	(d)	$3x + 2 \ln x + 5$	

(9)	The volume of the solid formed by rotating the region enclosed by the curve $f(x) = x^2$, the x -axis, and the lines $x = -2$, $x = 2$ a full revolution around the x -axis is..... cube unit.						
(a)	$\frac{16}{5} \pi$	(b)	$\frac{64}{5} \pi$	(c)	$\frac{32}{5} \pi$	(d)	4π

(10)	If the function $f(x) = x^3 - ax^2 + 15$ has an inflection point at $x = 3$, then the value of $a = \dots\dots\dots$						
(a)	3	(b)	6	(c)	9	(d)	12

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

(11)	If the two lines $\vec{r}_1 = (-2\vec{i} + 3\vec{j} + \vec{k}) + t_1(5\vec{i} - \vec{j} - \vec{k})$ and $\vec{r}_2 = (3\vec{i} - 3\vec{j} + 5\vec{k}) + t_2(m\vec{i} - 5\vec{j} + 5\vec{k})$ are orthogonal, then $m = \dots\dots\dots$						
(a)	zero	(b)	1	(c)	3	(d)	5

(12)	If the function f is continuous on its domain R , $\int_1^5 f(x)dx = 6$, $\int_1^7 f(x)dx = 13$, then $\int_7^5 2f(x)dx = \dots\dots\dots$						
(a)	-14	(b)	-7	(c)	7	(d)	14

(13)	ABCD is a rectangle, $AC = 10$ cm, $BC = 8$ cm, then $\vec{BA} \cdot \vec{DC} = \dots\dots\dots$						
(a)	-80	(b)	-36	(c)	36	(d)	80

(14)	The standard form of the equation of the plane that intersecting the positive coordinate axes x, y, z at $5, 3, 3$ respectively is			
(a)	$5x + 3y + 3z = 15$	(b)	$5x + 3y + 3z = 1$	
(c)	$3x + 5y + 5z = 15$	(d)	$3x + 5y + 5z = 1$	

(15)	If $x = \sec^2 \theta - 1, y = \tan \theta, \theta = \frac{-3\pi}{4}$, then $\frac{dy}{dx} = \dots\dots\dots$						
(a)	-2	(b)	$\frac{-1}{2}$	(c)	$\frac{1}{2}$	(d)	2

(16)	The absolute minimum value of $f: f(x) = 10xe^{-x}$ on the interval $[0, 4]$ equal.....						
(a)	zero	(b)	1	(c)	$\frac{10}{e}$	(d)	$\frac{40}{e}$

(17)	The ratio between the sixth term and middle term in the expansion of $(1 + x)^8$ according to the ascending powers of x when $T_4 = 7$ equals						
(a)	1 : 5	(b)	2 : 5	(c)	3 : 5	(d)	4 : 5

(18)	The curve of the function $f: f(x) = \sqrt[5]{(x - 3)^3}$ is convex upward when $x \in \dots\dots\dots$						
(a)	$] - \infty, 3[$	(b)	$]3, \infty [$	(c)	R	(d)	R^-

Third: essay questions “two marks for each question”.

(19)	Prove that: $\left(\frac{\omega+i}{1+i\omega^2} - \frac{1}{1+i\omega} \right)^{12} = -64$
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(20)	If the perimeter of a circular sector is 12 cm, find in radian measure ,the measure of its central angle which makes the area of the sector maximum.
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