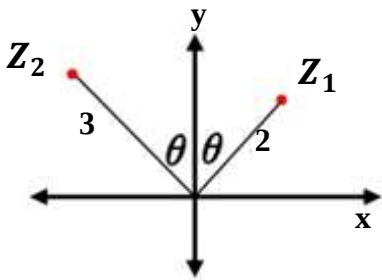


نموذج (١) لامتحان شهادة إتمام الدراسة الثانوية العامة ٢٠٢٥/٢٠٢٦ م

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

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

(1)	In the opposite Argad's plane: If Z_1 , Z_2 are two complex numbers, then $Z_1 Z_2 = \dots\dots\dots$						
(a)	6	(b)	-6	(c)	$6i$	(d)	$-6i$
(2)	In the expansion of: $(x^2 + 2 + \frac{1}{x^2})^4$, the term free of x is						
(a)	T_2	(b)	T_3	(c)	T_4	(d)	T_5
(3)	If $\overrightarrow{AB} = (8, 2, 5)$, $\overrightarrow{BC} = (4, -6, -2)$, then $\ \overrightarrow{AC}\ = \dots\dots\dots$						
(a)	11	(b)	12	(c)	13	(d)	20
(4)	If $y = e^{(1 + 2\ln x)}$, then the slope of the tangent at $x = 1$ equals						
(a)	$2e$	(b)	$\frac{1}{2}e$	(c)	e^2	(d)	$2e^2$
(5)	If: $x y' = 3 + y$, and $x = 1$ at $y = -2$, then.....						
(a)	$ y = x + 3 $	(b)	$ x = y + 3 $	(c)	$ y + 2x = 0$	(d)	$ y + x = 1$
(6)	If the measure of the angle between the straight line: $\vec{r} = (3, 2, 0) + t(2, -1, m)$ and the plane: $\vec{r} \cdot (3, 2, 1) = 30$ equals 30° , then $m = \dots\dots\dots$						
(a)	3 or $\frac{-1}{5}$	(b)	3 or $\frac{1}{5}$	(c)	-3 or $\frac{1}{5}$	(d)	-3 or $\frac{-1}{5}$

(7)	In the expansion of: $(1 - x)^8 (1 + x + x^2)^8$, if the coefficient of x^6 equals ${}^8C_{(m^3+10)}$, then the value of m may be			
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(a)	-8	(b)	-2	(c)	2	(d)	8
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(8)	If the rate of change of the slope of the tangent to curve of a function at any point on it is $(6x-3)$, the curve passes through the point $(2, 2)$ and the tangent to the curve at $x = 1$ is horizontal, then the equation of the curve is: $y = \dots\dots\dots$			
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(a)	$x^3 - 3x^2$	(b)	$x^3 - \frac{3}{2}x^2 + 2$	(c)	$x^3 - \frac{3}{2}x^2$	(d)	$x^3 + \frac{3}{2}x^2$
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(9)	The volume of the solid generated from revolving the region bounded by the curve: $y = 2x - x^2$ and the x -axis a complete revolution about the x -axis equals cube unit			
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(a)	$\frac{1}{15}\pi$	(b)	$\frac{16}{15}\pi$	(c)	$\frac{31}{15}\pi$	(d)	$\frac{38}{15}\pi$
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(10)	If: $f(x) = \frac{1}{4}ax^4 - 8bx$ such that a, b are constants, the curve of the function has a local maximum value at the point $(2, 5)$, then $a + b = \dots\dots\dots$			
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(a)	$-\frac{5}{12}$	(b)	$-\frac{5}{6}$	(c)	$\frac{5}{12}$	(d)	$\frac{5}{6}$
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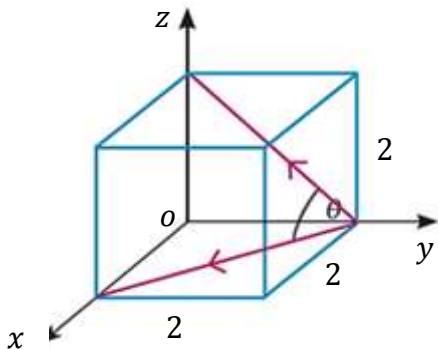
Second: Multiple choice questions” two marks for each item”

(11)	If the two straight lines: $\vec{r} = (1, 7, 3) + t(2, m, 5)$ and $\frac{x-2}{3m} = \frac{y+1}{2} = \frac{2-z}{8}$ are orthogonal, then $m = \dots\dots\dots$			
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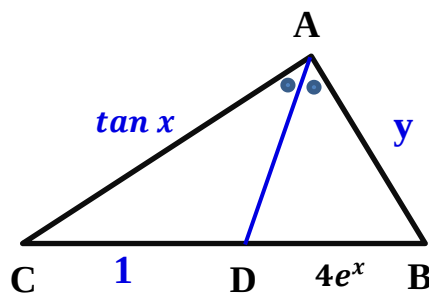
(a)	5	(b)	8	(c)	35	(d)	40
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(12)	If: $f(2) = 2, f(3) = 1$ and $\int_2^3 (x^2 f'(x) + 2xf(x)) dx = k - 5$, then $k = \dots\dots\dots$			
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(a)	4	(b)	5	(c)	6	(d)	7
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(13)	In the opposite figure:  $\cos \theta = \dots\dots$			
(a)	$\frac{1}{3}$	(b) $\sqrt{\frac{1}{3}}$	(c) $\sqrt{\frac{1}{2}}$	(d) $\frac{1}{2}$

(14)	The equation of the plane that contains the straight line: $x = 1 + 4t$, $y = 2 + t$, $z = 4 + 11t$ and perpendicular to the straight line : $\vec{r} = (4, 15, 8) + m(2, 3, -1)$ is			
(a)	$2x - 3y + z = 4$	(b) $2x + 3y + z = 4$	(c) $2x - 3y - z = 4$	(d) $2x + 3y - z = 4$

(15)	In the opposite figure:  $\frac{dy}{dx} = \dots\dots$ at $x = \frac{\pi}{4}$			
(a)	12	(b) $12e^4$	(c) $12e^{\frac{\pi}{4}}$	(d) $e^{\frac{\pi}{4}}$

(16)	The function $f: f(x) = \sin x - \cos x$ at $x \in [0, \pi]$ has an absolute minimum value =			
(a)	-2	(b) -1	(c) 1	(d) 2

(17)	In the expansion of $(x^2 + (ax)^{-1})^{12}$, if the ratio between the term free of x and the coefficient of x^3 respectively equals 5 : 16 according to the descending powers of x , then the value of $a = \dots\dots\dots$							
(a)	1	(b)	2	(c)	3	(d)	4	

(18)	The function $f: f(x) = x e^{(x-x^2)}$ is increasing on						
(a)	R	(b)	R^+	(c)	$] 0, 1 [$	(d)	$] \frac{-1}{2}, 1 [$

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

(19)	If : $Z_1 = 4 [\sin (90^\circ - \theta) + i \cos (90^\circ - \theta)]$, $Z_2 = 8 [\cos (45^\circ + \theta) + i \sin (45^\circ + \theta)]$ Find : $\left(\frac{Z_2}{Z_1} \right)^2$
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(20)	A particle moves on the curve: $y = 2x^3 - 3x^2 + 4$ and at the moment in which $x = 2$, the x-component increases by the rate $\frac{1}{2}$ unit /sec . Find the rate of change of the y-component at this moment.
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