SET 2 EXAM 1

Reading time: 15 minutes

Writing time: 60 minutes

Structure of examination

Number of questions	Number of questions to be answered	Number of marks
10	10	40

Note: Formula Sheet is NOT supplied. You will need to use your own!

- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners, rulers.
- Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape or a calculator of any type.

Materials supplied

- · Question and answer book
- Working space is provided throughout the book

Instructions

- Complete all responses in the spaces provided
- All responses must be in English.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

Instructions

Answer all questions in the spaces provided.

In all questions where a numerical answer is required an exact value must be given unless otherwise specified. In questions where more than one mark is available, appropriate working must be shown.

Unless otherwise indicated, the diagrams in this book are not drawn to scale.

	Dif	ferentiate $\cos(x\log_e(x))$ with respect to x .	
	וגעו	recentiate cos(w log _e (w)) with respect to w.	
Find the equation of the normal to the curve $y = 2\sin^3(x) + 4x + 11$ at the point where $x = \pi$.	•		
Find the equation of the normal to the curve $y = 2\sin^2(x) + 4x + 11$ at the point where $x = x$.	•		2 r
		$0 = 3(\pi) + 4\pi + 11 \text{ at the point where } \pi = \pi$	2 r
	Fi	and the equation of the normal to the curve $y=2\sin^3(x)+4x+11$ at the point where $x=\pi$.	2 r
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3 marks

Question 2					
Find $g(x)$ given that $g(x)$	$g'(x) = \cos(2x) - 2\sin(x)$	(x) and q(0) = 1			
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J	Let f be a function defined over its maximal domain with the rule $f(x) = 2\log_e(5x) - 2$. Fin	d the rule
	the inverse function, f^{-1} .	
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		2 m
		111
S	State the domain of the function f^{-1} .	
_		
		1 n
Т	Let $g(x) = e^x$. List the transformations required in order to transform $g(x)$ into $f^{-1}(x)$.	
-	y(x) = c. Distance diameter in order to transform $y(x)$ into $y(x)$.	
_		

Question 4					
Find the general solution to the equation $2\sin^2(x) - 1 = \cos(x)$.					

Question 5

Let X be a continuous random variable with the following probability density function:

$$f(x) = \begin{cases} a\sin(x) & 0 \le x \le \pi \\ 0 & \text{otherwise} \end{cases}$$

		, , , , , , , , , , , , , , , , , , ,	0	otherwise		
a.	Find the exact value of a .					
		TOLERA MARINE CONTRACTOR OF THE STATE OF THE				·
		,				11 TO VOTE HITTER
						Andrews Comment
						3 mark
b.	Evaluate $\Pr\left(X < \frac{\pi}{3}\right)$.					
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					The street state of the state o	· na · · · · · ·
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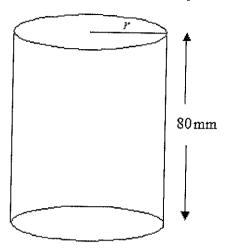
	estion 6 $y = \sin(\log_e(x)).$	
a.	Find the derivative, $\frac{dy}{dx}$.	
		1 mark
b.	Hence, evaluate $\int \left(\frac{1}{x}\sin\left(\frac{\pi}{2} - \log_e(x)\right)\right)dx$.	
		11 - 3-779-145
		2 marks
c.	Find the average value of the function $\frac{1}{x}\sin\left(\frac{\pi}{2}-\log_e(x)\right)$ for the interval $x\in[1,\pi]$.	

uestion 7				
wo points, $P(2ap, ap^2)$ and $(0, a)$, where a is a non-zero	d $Q(2aq,aq^2)$ lie on the constant, find the value	e curve $x^2 = 4ay$. The of pq (the production)	If the chord PQ passed tof p and q).	es through the po
	The state of the s			ymanne.
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Question 8
The Hettige Bakery prides itself on producing large loaves of bread. The mass of their loaves are normally distributed, with a mean of 760 g and a standard deviation of 7 g. A competing bakery, the Levy Bakery, also produces loaves with normally distributed masses. The Levy Bakery's masses have a mean of 768 g and a standard deviation of 14 g.
Tim wishes to buy a loaf of bread with a mass greater $750~\mathrm{g}$. Determine which bakery has the higher probability of producing a loaf with a mass greater than $750~\mathrm{g}$.
3 marks
O HIGHS
Question 9 Trevor either drives to university or catches the train. If he drives today, the probability that he will drive tomorrow is 80%. However, if he catches the train today, the probability he drives tomorrow is 75%. If Trevor drives to university on Monday, what is the probability that he drives to university exactly once on the next two days?
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Question 10

A small aluminium cylinder is placed in direct sunlight, where its radius increases at a constant rate whilst its height remains constant. The radius is increasing at a rate of 0.5 mm per hour.



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					7371
Find t	ne rate at which the sur	rface area is increa	sing when the rad	ius is 10 mm, in mm² per h	iour.
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3 marks

END OF EXAMINATION