

YEAR 12 MATHEMATICS METHODS Test 2 2016

		INSTRUCTIONS:		
50 тагка	sətunim 02	OAEBYIT:		
17 тагка	s91unim √1	Calculator section:		
33 тагкя	sətunim EE	Non-calculator section:		
		ТЕАСНЕЯ:		
Date: Tuesday 10th May		NAME:		
Exponential and Trigonometric Functions				

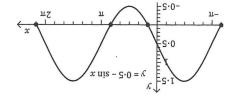
Show FULL working Answer all questions on this test paper

Questions or parts of questions worth more than two marks require working to be shown to receive full marks.

Allowed: Maths Methods WACE formula sheets

Q1 (5 marks)

Determine the equation of the tangent to the curve $y = \frac{\sin x}{x}$ at the point $(\pi, 0)$.



END OF SECTION 2

Q2 (3 + 3 + 3 + 3 = 12 marks)

Determine $\frac{dy}{dx}$ for each of the following simplifying answers where possible.

(a)
$$y = e^{x^2-1} + 2\cos(2x-1) + e^3$$

(b)
$$y = \sin^3 5 x$$

(c)
$$y = \frac{\cos x}{e^x}$$

(d)
$$y = e^{(1-x)} \sin 2x$$

- At what rate is the mass of the drug in the bloodstream changing
 - (i) after 12 hours?

(ii) when 25mg of the drug remains?

A section of the graph of the function $y = 0.5 - \sin x$ is shown below. Calculate the **enclosed area** between the function stated and the *x* axis as shown in the diagram.

Q3 (4 + 2 + 1 = 7 marks)Evaluate the following.

$$3xb.(3x \operatorname{mis} - \frac{x}{2} \operatorname{soo}) \int_{0}^{\frac{\pi}{E}} (6)$$

$$\frac{h \sin \alpha}{h \cos \alpha} \min_{\alpha = 0, \alpha} (a)$$

initial dose of 60 milligrams was administered.	
of the rule 1 hours after the mass of drug remaining 1 hours after the	
$M \le 1.0 - = \frac{Mb}{}$	
The mass of a drug remaining in the bloodstream of a patient is changing according	
(1 + 2 + 1 + 2 + 4 = 10 marks)	90

Circle the response below that best describes the type of relationship between M and l .

EXPONENTIAL GROWTH EXPONENTIAL DECAY

(d) Write down an equation for M in terms of I.

(c) Determine the mass of drug remaining in the bloodstream after one day.

(d) Determine, to the nearest hour, the time taken for less than one percent of the initial dose to remain in the bloodstream of the patient.

Q4
$$(2+2+3+2=9 \text{ marks})$$

Evaluate the following integrals.

(b)
$$\int \frac{2}{e^{3x}} dx$$

(c)
$$\int \frac{\sin x \cos^3 x}{2} \, dx$$

(d)
$$\int 4\sin x \cos x \cdot dx$$

END OF SECTION 1



YEAR 12 MATHEMATICS METHODS Test 2 2016

Exponential and Trigonometric Functions

NAME:		Date: Tuesday 10th May
TEACHER:	_	
Non-calculator section:	33 minutes	33 marks
Calculator section:	17 minutes	17 marks
OVERALL:	50 minutes	50 marks

INSTRUCTIONS:

Show FULL working Answer all questions on this test paper

Questions or parts of questions worth more than two marks require working to be shown to receive full marks.

Allowed: Maths Methods WACE formula sheets, 3 calculators, 1 A4 page of notes

Q5 (4 marks)

A curve passes through the point $(\frac{\pi}{2}, \pi - 2i)$ and has a gradient function given by $\frac{dy}{dx} = 1 - 2\cos x$. Determine the equation of the original curve.