Test 4 - Challenge Test

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Find $\frac{d}{dx} \sin(\ln(\tan^2 x))$.

2 marks

Question 2

Question 2
Find
$$\frac{d}{dx} \int_{x^2}^{x^3} \sin^3 t \, dt$$
.

2 marks

Calculus - Test 4 - Challenge Test

Question 3 Beware \triangle Let a be a fixed constant such that 0 < a < 3. With the aid of a diagram, show that

$$\int_0^a \sqrt{9-x^2} \, dx = \frac{9}{2} \left(\frac{\pi}{2} - \cos^{-1} \frac{a}{3} \right) + \frac{1}{2} a \sqrt{9-a^2}.$$

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3 marks

Calculus - Test 4 - Challenge Test

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Assume that the running cost of flying an aircraft can be modelled by

$$c = A + Bs^2$$

ne aircraft run at to min	t at \$120, and at a speed of imise its cost for a 2,000 kr	m trip? Round your answ	ver to 2 decimal place	ces.	4 mark
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ATAR Notes Mathematics Advanced Topic Tests - Calculus

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(c)	Find the exact value of $\int_{-1}^{1} e^{x} dx$.	1 mark
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	<u></u>	POSTERULO
(d)	Use your graph to justify why the trapezoidal rule overestimates $\int_{-1}^{1} e^{x} dx$.	1 mark
(e)	Hence, show algebraically that $e < 2 + \frac{3}{e}$.	2 marks
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END OF CALCULUS TEST 4