Instrument A-- Detect common errors in Indices in Elementary Mathematics

Laws of Indices

Name : ______________________________________ (   )

Class: __________________________

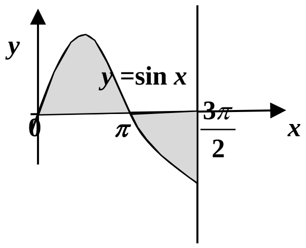
The following shows the solutions given by a student in one of his tests.
You are to check his workings and **underline** any mistakes that you can find.
For any mistakes found, you are to provide your correct solution in the space provided.

		Your solutions
Q1	Evaluate $-2x^0+7^0$ Solution : $-2x^0+7^0$ $=1+1$ $=2$	
Q2	Simplify $a^{10}\div a^2$ Solution : $a^{10}\div a^2$ $=a^{\frac{10}{2}}$ $=a^5$	
Q3	Simplify $(-3\times 2p)^3$ Solution : $(-3\times 2p)^3$ $=(-3\times 2p^3)$ $=-6p^3$	
Q4	Simplify $\left(\frac{2}{x}\right)^{-3}$ Solution : $\left(\frac{2}{x}\right)^{-3}$ $=\frac{-8}{x^{-3}}$ $=-8x^3$	

Q5	Simplify $8^{m} \times 8^{2}$ Solution : $8^{m} \times 8^{2}$ $= 8^{2m}$ $= 64^{m}$	
Q6	Express -9^{-1} as a power of 3. Solution : -9^{-1} $= -3^{2-1}$ $= -3$	
Q7	Simplify $27 \times \sqrt[5]{3}$. Solution : $27 \times \sqrt[5]{3}$ $= 3^{3} \times 3^{\frac{5}{2}}$ $= 3^{\frac{11}{2}}$	
Q8	Given $\frac{1}{\sqrt{8}} \times \sqrt[3]{4} = 2^{k}$, find the value of k. Solution : $\frac{1}{\sqrt{8}} \times \sqrt[3]{4} = 2^{k}$ $\frac{1}{8^{\frac{1}{2}}} \times 4^{\frac{1}{3}} = 2^{k}$ $\frac{1}{2^{\frac{3}{2}}} \times 4^{\frac{1}{3}} = 2^{k}$ $2^{-\frac{2}{3}} \times 2^{\frac{2}{3}} = 2^{k}$ $2^{-\frac{2}{3}+\frac{2}{3}} = 2^{k}$ $2^{0} = 2^{k}$ $k = 0$	

Instrument B --Detect common error in Calculus in Additional Mathematics and H2 Mathematics

	The following shows the solutions given by a student in one of his tests. You are to check his workings and underline any mistakes that you can find. For any mistakes found, you are to provide your correct solution in the space provided.	
		Your solutions
Q1	Find $\frac{d}{dx}\left(x^4x^{10}\right)$. Solution $\frac{d}{dx}\left(x^4x^{10}\right)$ $=\left(4x^3\right)\left(10x^9\right)$ $=40x^{12}$	
Q2	Find $\frac{d}{dx}\left(\sin 4x^2\right)$. Solution $\frac{d}{dx}\left(\sin 4x^2\right)$ $=\cos 4x^2$	
Q3	Given $y=\frac{2x-1}{3-x}$, find $\frac{dy}{dx}$. Solution $\frac{dy}{dx}=\frac{2\times 3-x-2x-1\times -1}{(3-x)^2}$ $=\frac{6-x-2x+1}{(3-x)^2}$ $=\frac{7-3x}{(3-x)^2}$	
Q4	Given $\frac{dy}{dx}=\frac{3}{(2-x)^2}$, determine whether the curve has any stationary point. Solution: $\frac{dy}{dx}=0$ $\frac{3}{(2-x)^2}=0$ $2-x=0$ $x=2$ There is a stationary point at $x = 2$	

Q5	Find $\int \frac{1}{x^2}dx.$ Solution $\int \frac{1}{x^2}dx$ $= \ln x^2 + c$	
Q6	Find $\int \sec^2 x \ dx$ Solution $\int \sec^2 x \ dx$ $= \frac{1}{3}\sec^3 x + c$	
Q7	A curve is such that $\frac{dy}{dx} = 2x^2$. Given that the curve passes through the point (3, 2), find the equation of the curve. Solution: The equation of the curve is $y = (2x^2)x + c$ $2 = (2 \times 3^2)(3) + c$ $c = -52$ The equation is $y = 2x^3 - 52$	
Q8	Find the shaded area in the following diagram. 	
	Solution $\int_0^{\frac{3\pi}{2}} \sin x \ dx$ $= [-\cos x]_0^{\frac{3\pi}{2}}$ $= \left[-\cos\frac{3\pi}{2}\right] - [-\cos 0]$ $= 0 + 1$ $= 1 \text{ unit}^2$	