

ĐÁP ÁN ĐỀ THI CHÍNH THỨC

Câu	Nội dung	Thang điểm
1	Tìm ma trận nghịch đảo	2.0
	$(A I_3) = \left(\begin{array}{ccc ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ -3 & 1 & 2 & 0 & 1 & 0 \\ 2 & 2 & 13 & 0 & 0 & 1 \end{array} \right)$	0.5
	$\xrightarrow{\substack{d_2 \rightarrow d_2 + 3d_1 \\ d_3 \rightarrow d_3 - 2d_1}} \left(\begin{array}{ccc ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 5 & 3 & 1 & 0 \\ 0 & 2 & 11 & -2 & 0 & 1 \end{array} \right)$	0.5
	$\xrightarrow{d_3 \rightarrow d_3 - 2d_2} \left(\begin{array}{ccc ccc} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 5 & 3 & 1 & 0 \\ 0 & 0 & 1 & -8 & -2 & 1 \end{array} \right)$	0.25
	$\xrightarrow{\substack{d_1 \rightarrow d_1 - d_3 \\ d_2 \rightarrow d_2 - 5d_3}} \left(\begin{array}{ccc ccc} 1 & 0 & 0 & 9 & 2 & -1 \\ 0 & 1 & 0 & 43 & 11 & -5 \\ 0 & 0 & 1 & -8 & -2 & 1 \end{array} \right)$	0.5
	Vậy $A^{-1} = \begin{pmatrix} 9 & 2 & -1 \\ 43 & 11 & -5 \\ -8 & -2 & 1 \end{pmatrix}$	0.25
2	Giải hệ	2.0
	Ta có $\bar{A} = (A B) = \left(\begin{array}{cccc c} 1 & -1 & -1 & -1 & 0 \\ 2 & -3 & -3 & 1 & 2 \\ -1 & 2 & 1 & 1 & 0 \\ 3 & -1 & -2 & 3 & 7 \end{array} \right)$	0.25
	$\xrightarrow{\substack{d_2 \rightarrow d_2 - 2d_1 \\ d_3 \rightarrow d_3 + d_1 \\ d_4 \rightarrow d_4 - 3d_1}} \left(\begin{array}{cccc c} 1 & -1 & -1 & -1 & 0 \\ 0 & -1 & -1 & 3 & 2 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 2 & 1 & 6 & 7 \end{array} \right)$	0.75
	$\xrightarrow{\substack{d_3 \rightarrow d_3 + d_2 \\ d_4 \rightarrow d_4 - 2d_2}} \left(\begin{array}{cccc c} 1 & -1 & -1 & -1 & 0 \\ 0 & -1 & -1 & 3 & 2 \\ 0 & 0 & -1 & 3 & 2 \\ 0 & 0 & -1 & 12 & 11 \end{array} \right)$	0.5
	$\xrightarrow{d_4 \rightarrow d_4 + d_3} \left(\begin{array}{cccc c} 1 & -1 & -1 & -1 & 0 \\ 0 & -1 & -1 & 3 & 2 \\ 0 & 0 & -1 & 3 & 2 \\ 0 & 0 & 0 & 9 & 9 \end{array} \right)$	0.25

	Vậy nghiệm của hệ là $\begin{cases} x_1 = 2 \\ x_2 = 0 \\ x_3 = 1 \\ x_4 = 1 \end{cases}$	0.25
3	Tính giới hạn	2.0
	$A = \lim_{x \rightarrow 0} \left[(1 + 5x^2)^{\frac{1}{5x^2}} \right]^{\frac{5x^2}{\cos x - 1}}$	0.5
	Ta tính: $\lim_{x \rightarrow 0} \frac{5x^2}{\cos x - 1} = \lim_{x \rightarrow 0} \frac{10x}{-\sin x}$	0.5
	$= \lim_{x \rightarrow 0} \frac{10}{-\cos x}$	0.5
	$= -10$	0.25
	Vậy $A = e^{-10}$	0.25
4	$I = \int \frac{1}{x\sqrt{x+1}} dx$	2.0
	Đặt: $t = \sqrt{x+1} \Rightarrow t^2 = x+1 \Leftrightarrow x = t^2 - 1$	0.25
	$\Rightarrow 2tdt = dx$	0.25
	$I = \int \frac{2}{(t^2 - 1)t} tdt$	0.25
	$I = \int \left(\frac{2}{t^2 - 1} \right) dt$	0.25
	$I = \int \left(\frac{1}{t-1} - \frac{1}{t+1} \right) dt$	0.5
	$I = \ln \left \frac{t-1}{t+1} \right + C$	0.5
5	$I = \int_0^{\frac{\pi}{2}} \cos^3 x dx$	2.0
	$I = \int_0^{\frac{\pi}{2}} (1 - \sin^2 x) \cos x dx$	0.25
	Đặt $t = \sin x \Rightarrow dt = \cos x dx$	0.50
	$x = 0 \Rightarrow t = 0; x = \frac{\pi}{2} \Rightarrow t = 1$	0.25
	$I = \int_0^1 (1 - t^2) dt$	0.25
	$I = \left(t - \frac{t^3}{3} \right) \Big _0^1$	0.50
	$I = \frac{2}{3}$	0.25