MATHS

BOOKS - SUNSTAR MATHS (KANNADA ENGLISH)

K-CET-MATHEMATICS-2015

Multiple Choice Questions

1. Write the set builder form $A = \{-1, 1\}$

A. A= {x: x is a root of the equation $x^2 + 1 = 0$}

B. A= {x: x is a root of the equation $x^2 - 1 = 0$}

C. A= {x : x is an integer}

D. A = {x : x is a real number}

Answer: B

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2. If the operation $\oplus$ is defined by $a \oplus b = a^2 + b^2$ for all real numbers 'a' and 'b' then $(2 \oplus 3) \oplus 4$ = _____

A. 185

B. 184

C. 182

D. 181

Answer: A

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3. If $Z = \frac{\left(\sqrt{3}+1\right)^3 (3i+4)^2}{(8+6i)^2}$ then |Z| is equal to

A. 3

B. 2

C. 1

D. 0

Answer: B

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4.

$f(x) = \frac{1}{2} - \tan\left(\frac{\pi x}{2}\right) - 1 < x < 1$ and $g(x) = \sqrt{(3+4x-4x^2)}$

. Find domain of $(f+g)$

A. a.$(-1, 1)$

B. b. $\left[-\frac{1}{2}, \frac{3}{2}\right]$

C. c. $\left[\frac{-1}{2}, 1\right]$

D. d. $\left[\frac{-1}{2}, 1\right]$

Answer: D

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5. If the 2^{nd} and 5^{th} terms of G.P. are 24 and 3 respectively then the sum of 1^{st} six terms is :

A. $\frac{2}{189}$

B. $\frac{179}{2}$

C. $\frac{189}{5}$

D. $\frac{189}{2}$

Answer: D

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6. The middle term of expansion $\left(\frac{10}{x}+\frac{x}{10}\right)^{10}$ is

A. ${}^{10}C_5$

B. ${}^{9}C_5$

C. ${}^{8}C_5$

D. ${}^{7}C_5$

Answer: A

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7. If $\begin{vmatrix} 2a & x_1 & y_1 \\ 2b & x_2 & y_2 \\ 2c & x_3 & y_3 \end{vmatrix} = \frac{abc}{2} \neq 0$, then the area of the triangle whose vertices are $\left(\frac{x_1}{a}, \frac{y_1}{a}\right), \left(\frac{x_2}{b}, \frac{y_2}{b}\right)$ and $\left(\frac{x_3}{c}, \frac{y_3}{c}\right)$

A. $\frac{1}{8}$

B. $\frac{1}{4}$

C. $\frac{1}{8}abc$

D. $\frac{1}{4}abc$

Answer: A

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8. If α and β are the roots of $x^2 - ax + b^2 = 0$, then $\alpha^2 + \beta^2$ is equal to_____

A. $a^2 + b^2$

B. $a^2 - b^2$

C. $2a^2 - b^2$

D. $a^2 - 2b^2$

Answer: D

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9. $\sim[(\sim p) \wedge q]$ is logically equivalent to :

A. $\sim(p \vee q)$

B. $\sim[p \wedge (\sim q)]$

C. $p \wedge (\sim q)$

D. $p \vee (\sim q)$

Answer:

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10. The value of $\sin^{-1}\left(\frac{2\sqrt{2}}{3}\right) + \sin^{-1}\left(\frac{1}{3}\right)$ is equal to

A. $\frac{2\pi}{3}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{2}$

D. $\frac{\pi}{6}$

Answer: C

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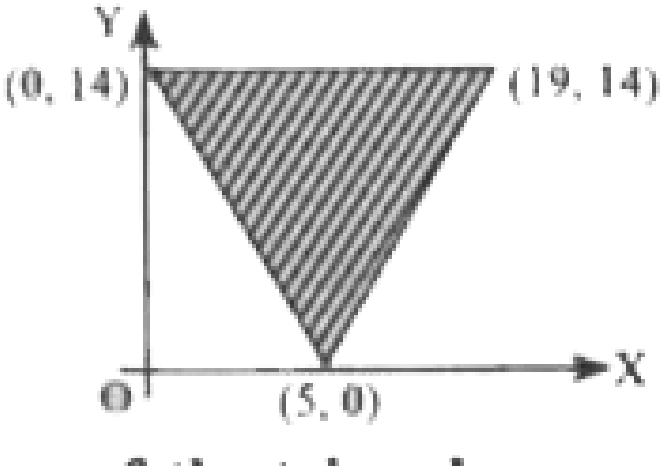
11. The shaded region shown in fig. is given by the inequation



A. 1)$14x + 5y \geq 70, y \geq 14$ and $x - y \geq 5$

B. 2)$14x + 5y \leq 70, y \leq 14$ and $x - y \geq 5$

C. 3)$14x + 5y \geq 70, y \leq 14$ and $x - y \geq 5$

D. 4)$14x + 5y \geq 70, y \leq 14$ and $x - y \leq 5$

Answer: D

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12. If $\vec{a} = \hat{i} + 2\hat{j} + 2\hat{k}, \left|\vec{b}\right| = 5$ and angle between $\vec{a}$ and $\vec{b}$ is $\frac{\pi}{60,}$ then the area of the triangle formed by these two vectors as two side is :

A. $\frac{15\sqrt{3}}{2}$

B. $\frac{15}{4}$

C. 15

D. $\frac{15}{2}$

Answer: B

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13. If $\vec{a} = i - 2j + 3k$, $\vec{b}$ is a vector such that $\vec{a} . \vec{b} = \left|\vec{b}\right|^2 \left|\vec{a} - \vec{b}\right| = \sqrt{7}$, then $\left|\vec{b}\right|$= _____

A. a.21

B. b.$\sqrt{7}$

C. c.14

D. d.7

Answer: B

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14. If direction cosines of a vector of magnitude 3 are $\frac{2}{3}, -\frac{a}{3}, \frac{2}{3}$ and $a > 0$, then vector is _____

A. $i + 2j + 2k$

B. $i - 2j + 2k$

C. $2i - j + 2k$

D. $2i + j + 2k$

Answer:

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15. If the eccentricity of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ is $\frac{5}{4}$ and $2x + 3y - 6 = 0$ is a focal chord of the hyperbola, then the length of transverse axis is equal to _____

A. $\frac{5}{24}$

B. $\frac{6}{5}$

C. $\frac{24}{5}$

D. $\frac{12}{5}$

Answer: C

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16. Foot of perpendicular drawn from the origin to the plane $2x - 3y + 4z = 29$ is_____

A. $(5, -2, 3)$

B. $(7, -1, 3)$

C. $(2, -3, 4)$

D. $(5, -1, 4)$

Answer: C

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17. If two dice are thrown simultaneously, then the probability that the sum of the numbers which come up on the dice to be more than 5 is_____

A. $\frac{13}{18}$

B. $\frac{5}{18}$

C. $\frac{1}{6}$

D. $\frac{5}{36}$

Answer: A

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18. If $f(y) = f\left(x^2 + 2\right)$ and $f'(3) = 5$, then $\frac{dy}{dx}$ at $x = 1$ is :

A. 10

B. 15

C. 25

D. 5

Answer: A

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19. If $x = a\cos^3\theta, y = a\sin^3\theta$, then $1 + \left(\frac{dy}{dx}\right)^2$ is_____

A. 1

B. $\sec^2\theta$

C. $\tan^2\theta$

D. $\tan\theta$

Answer: B

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20. Equatin of line passing through the point (2,3,1) and parallel to the line of intersection of the planes x−2y−z+6=0 and x+y+3z=5 is

A. $\frac{x-2}{4}=\frac{y-3}{3}=\frac{z-1}{2}$

B. $\frac{x-2}{5}=\frac{y-3}{4}=\frac{z-1}{3}$

C. $\frac{x-2}{-5}=\frac{y-3}{-4}=\frac{z-1}{3}$

D. $\frac{x-2}{5}=\frac{y-3}{-4}=\frac{z-1}{3}$

Answer: C

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21. $\int \frac{1}{x^2(x^4+1)^{3/4}}dx$ is equal to_____

A. $\frac{-(1+x^4)^{3/4}}{x}+C$

B. $\frac{-(1+x^4)^{1/4}}{2x}+C$

C. $\frac{-(1+x^4)^{1/4}}{x^2}+C$

D. $\frac{-(1+x^4)^{1/4}}{x}+C$

Answer: D

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22. If $f: R \to R$ is defined by $f(x) = \frac{x}{x^2+1}$ find f(f(2))

A. 1)29

B. 2)$\frac{29}{10}$

C. 3) $\frac{10}{29}$

D. 4) $\frac{1}{29}$

Answer: C

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23. Evalute $\begin{vmatrix} \cos 15^\circ & \sin 15^\circ \\ \sin 75^\circ & \cos 75^\circ \end{vmatrix}$

A. 3

B. 2

C. 0

D. 1

Answer: C

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24. Slope of normal to the curve $y = x^2 - \frac{1}{x^2}$ at $(-1, 0)$ is

A. -4

B. 4

C. $-\frac{1}{4}$

D. $\frac{1}{4}$

Answer: D

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25. $\int_0^{\pi/4} \log\left(\frac{\sin x + \cos x}{\cos x}\right) dx$

A. a. $\log 2$

B. b. $\frac{\pi}{8}\log 2$

C. c. $\frac{\pi}{2}\log 2$

D. d. $\frac{\pi}{4}\log 2$

Answer: B

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26. Area bounded by $y = x^3, y = 8$ and $x = 0$ is _____

A. 1)6sq units

B. 2)12 sq units

C. 3)14 sq units

D. 4)2 sq units

Answer: B

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27. Let $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = \hat{i} - ahtj + \hat{k}$ and $\hat{i} - \hat{j} - \hat{k}$ be three vectors. A vector $\vec{v}$ in the plane of $\vec{a}$ and $\vec{b}$, whose projection on $\vec{c}$ is $\frac{1}{\sqrt{3}}$, is given by :

A. $4i - j + 4k$

B. $i + j - 2k$

C. $4i + j - 4k$

D. $3i + j - 3k$

Answer: A

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28. The mean deviation of the data 3, 10, 10, 4, 7, 10, 5 from the mean is :

A. 2.57

B. 3.75

C. 2

D. 3

Answer: A::D

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29. A man takes a step forward with probability 0.4 and one step backward with probability 0.6, then the probability that at the end of eleven steps he is one step away from the starting point is

A. ${}^{11}C_6 \times (0.72)^6$

B. ${}^{11}C_5 \times (0.12)^5$

C. ${}^{11}C_6 \times (0.24)^5$

D. ${}^{11}C_5 \times (0.48)^5$

Answer: C

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30. If the function g(x) is defined by $g(x) = \frac{x^{200}}{200} + \frac{x^{199}}{199} + \ldots\ldots + \frac{x^2}{2} + x + 5$, then g'(0)=_____

A. 1)5

B. 2)100

C. 3)200

D. 4)1

Answer: D

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31. A box contains o red marbles number from 1 through 6 and 4 white marbles 12 through 15 .Find the probability that a marble drawn at random is white and old number :

A. $\frac{1}{6}$

B. 6

C. $\frac{1}{5}$

D. 5

Answer: C

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32. $\lim_{x \to 0} \frac{1 - \cos x}{x^2}$ is :

A. $\frac{1}{3}$

B. $\frac{1}{2}$

C. 3

D. 2

Answer: B

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33. The probability distribution of x is

x	0	1	2	3
P(x)	0.2	k	k	2k

Find the value of k

A. 1)0.1

B. 2)0.4

C. 3)0.3

D. 4)0.2

Answer: D

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34. If $f(x) = 2x^2$, find $\frac{f(3.8) - f(4)}{3.8 - 4}$:

A. 0.156

B. 15.6

C. 156

D. 1.56

Answer: B

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35. If x=ct and $y = \frac{c}{t}$, find $\frac{dy}{dx}$ at t=2

A. a. 0

B. b. $\frac{-1}{4}$

C. c. 4

D. d. $\frac{1}{4}$

Answer: B

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36. A balloon which always remains spherical is being inflated by pumping in 10 cubic centimeters of gas per second. Find the rate at which the radius of the balloon is increasing when the radius is 15cm.

A. 1) $\frac{1}{\pi} cm / \sec$

B. 2) $\frac{1}{30\pi} cm / \sec$

C. 3) $\frac{1}{9\pi} cm / \sec$

D. 4) $\frac{1}{90\pi} cm / \sec$

Answer: D

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37. $f(x) = \begin{cases} 3x - 8 & \text{If } x \leq 5 \\ 2k & \text{if} x > 5 \end{cases}$ is continuous, find k

A. a. $\frac{7}{2}$

B. b. $\frac{4}{7}$

C. c. $\frac{3}{7}$

D. d. $\frac{2}{7}$

Answer: A

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38. $\int e^x \frac{1+\sin x}{1+\cos x}$ dx is equal to

A. $e^x \sin x + C$

B. $e^x + C$

C. $\tan\left(\frac{x}{2}\right) + C$

D. $e^x \tan\left(\frac{x}{2}\right) + C$

Answer: D

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39. If $1, w, w^2$ are three cube roots of unity, then $\left(1-w+w^2\right)\left(1+w-w^2\right)$ is _____

A. 1)4

B. 2)3

C. 3)2

D. 4)1

Answer: A

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40. Solve for x $\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1} x, x > 0$

A. 1)$\frac{1}{\sqrt{3}}$

B. 2)-1

C. 3)1

D. 4)$\sqrt{3}$

Answer: A

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41. The system of linear equations :

$x + y + z = 6, x + 2y + 3z = 1$ and $x + 2y + az = 6$ has no solutions when :

A. $b = 3a \neq 10$

B. $b = 2a = 3$

C. $a = 3b \neq 10$

D. $a = 2b \neq 3$

Answer: C

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42. Evaluate $\int \frac{\sin^2 x}{1 + \cos x} dx$

A. $\cos x + C$

B. $\sin x + C$

C. $x - \sin x + C$

D. $x + \sin x + C$

Answer: C

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43. If $\frac{(x+1)^2}{x^3+x} = \frac{A}{x} + \frac{Bx+C}{x^2+1}$, then $\text{cosec}^{-1}\left(\frac{1}{A}\right) + \cot^{-1}\left(\frac{1}{B}\right) + \sec^{-1} C =$ _____

A. a. $\frac{\pi}{2}$

B. b. $\frac{\pi}{6}$

C. c. 0

D. d. $\frac{5\pi}{6}$

Answer: D

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44. The remainder obtained when $1! + 2! + 3! + \ldots. + 11!$ is divided by 12 is_____

A. 1)6

B. 2)7

C. 3)8

D. 4)9

Answer: D

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45. If $\alpha \leq 2\sin^{-1}x + \cos^{-1}x \leq \beta$, then

A. 1) $\alpha = 0, \beta = 2\pi$

B. 2) $\alpha = 0, \beta = \pi$

C. 3) $\alpha = \frac{-\pi}{2}, \beta = \frac{3\pi}{2}$

D. 4) $\alpha = \frac{-\pi}{2} \beta = \frac{\pi}{2}$

Answer: B

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46. If $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$, then A^2 equal to_____

A. 1) $\begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$

B. 2) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

C. 3) $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$

D. 4) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

Answer: B

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47. The value of $\tan(1^\circ) + \tan(89^\circ)$ is _____

A. $\frac{1}{\sin(2^\circ)}$

B. $\frac{2}{\sin(1^\circ)}$

C. $\frac{2}{\sin(2^\circ)}$

D. $\frac{1}{\sin(1^\circ)}$

Answer: C

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48. If $y = \log\left(\frac{1-x^2}{1+x^2}\right)$, then $\frac{dy}{dx}$ is equal to _____

A. 1) $\frac{-4x^3}{1-x^4}$

B. 2) $\frac{1}{4-x^4}$

C. 3) $\frac{4x^3}{1-x^4}$

D. 4) $\frac{-4x}{1-x^4}$

Answer: D

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49. The two curves $x^3 - 3xy^2 + 2 = 0$ and $3x^2y - y^3 - 2 = 0$:

A. cut at angle $\frac{\pi}{4}$

B. cut at angle $\frac{\pi}{3}$

C. cut at right angle

D. touch each other

Answer: C

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50. If x is real, the minimum value of $x^2 - 8x + 17$ is :

A. 4

B. 3

C. 2

D. 1

Answer: D

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51. $\int_{-\pi/4}^{\pi/4} \frac{dx}{1+\cos 2x}$ is equal to

A. 1)0

B. 2)4

C. 3)1

D. 4)2

Answer: C

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52. The function $f(x) = [x]$, where [x] denotes greatest integer function is continuous at _____

A. a.1.5

B. b.1

C. c.-2

D. d.4

Answer: A

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53. The solution of differential equation :

$x\frac{dy}{dx}+2y=x^2$ is :

A. $y=\frac{x^4+C}{4x^2}$

B. $y=\frac{x^4+C}{x^2}$

C. $y=\frac{x^2}{4}+C$

D. $y=\frac{x^2C}{4x^2}$

Answer: A

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54. If $\sin x + \sin y = \frac{1}{2}$ and $\cos x + \cos y = 1$, then $\tan(x + y)$ =_____

A. $\frac{4}{3}$

B. $\frac{-8}{3}$

C. $-\frac{3}{4}$

D. $\frac{8}{3}$

Answer: A

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55. If $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ and $|A^3| = 27$, then α= _____

A. $\pm\sqrt{5}$

B. $\pm\sqrt{7}$

C. ± 2

D. ± 1

Answer: B

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56. The order of differential equation of all circles of given radius 'a' is _____

A. a.3

B. b.1

C. c.2

D. d.4

Answer: C

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57. A line passes through (2,2) and is perpendicular to the line $3x + y = 3$, its y-intercepts is_____

A. 1

B. $\frac{4}{3}$

C. $\frac{2}{3}$

D. $\frac{1}{3}$

Answer: B

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58. Let $f: R \to R$ be defined by $f(x) = \frac{1}{x} \forall x \in R$, then f is

_____

A. 1)f is not defined

B. 2)bijective

C. 3)onto

D. 4)one-one

Answer: A

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59. The solution set of the inequation $\frac{x^2+6x-7}{|x+4|}<0$ is _____

A. 1)$(-7,-4)\cup(4,1)$

B. 2)$(-7,-4)\cup(-4,1)$

C. 3)$(-7,-4)$

D. 4)$(-7,1)$

Answer: B

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60. If $P = \begin{vmatrix} x & 1 \\ 1 & x \end{vmatrix}$ and $Q = \begin{vmatrix} x & 1 & 1 \\ 1 & x & 1 \\ 1 & 1 & x \end{vmatrix}$ then $\frac{dQ}{dx} =$ _____

A. 1)3P

B. 2)$-3P$

C. 3)$1 - 3P$

D. 4)$3P + 1$

Answer: A

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