

Maths B Revision Session

Q. Expand: $(a+b)^n$

Solution: $(a+b)^n$

$$= (a + b)^n$$

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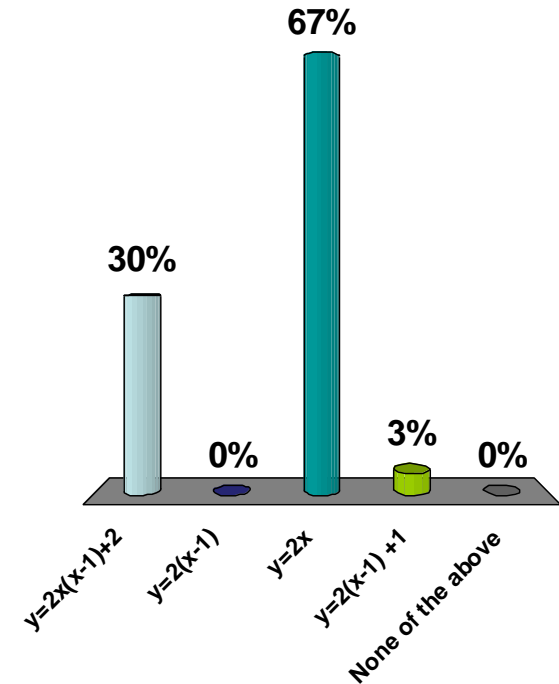
$$= (a + b)^n$$

$$= \dots \text{ etc}$$

Q.E.D. ...

1. The equation of the tangent to the curve $y = x^2 + 1$ at the point $P=(1,2)$ is:

1. $y=2x(x-1)+2$
2. $y=2(x-1)$
- ✓ 3. $y=2x$
4. $y=2(x-1) + 1$
5. None of the above



2. The equation of the normal to the curve $y = x^2 + 1$ at the point $P=(1,2)$ is:

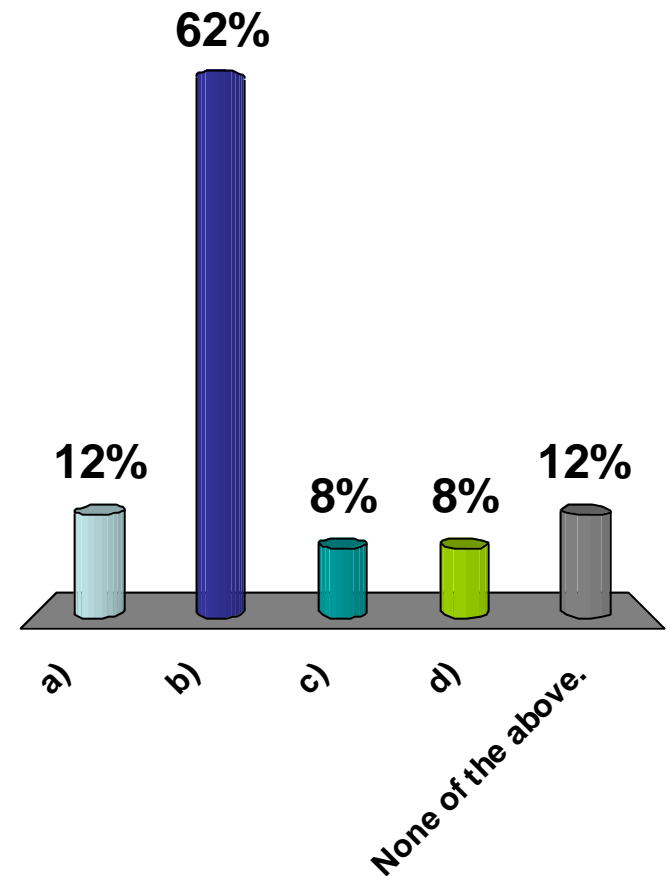
1. a) $y = \frac{1}{2x}(x-1) + 2$

✓ 2. b) $y = -\frac{1}{2}(x-1) + 2$

3. c) $y = -\frac{1}{2x}(x-1) + 2$

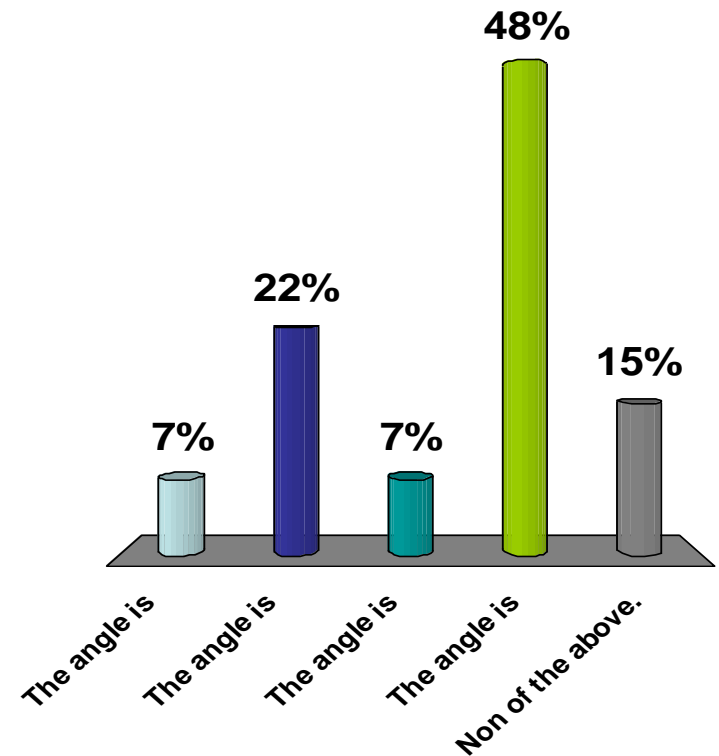
4. d) $y = \frac{1}{2}(x-1) + 2$

5. None of the above.



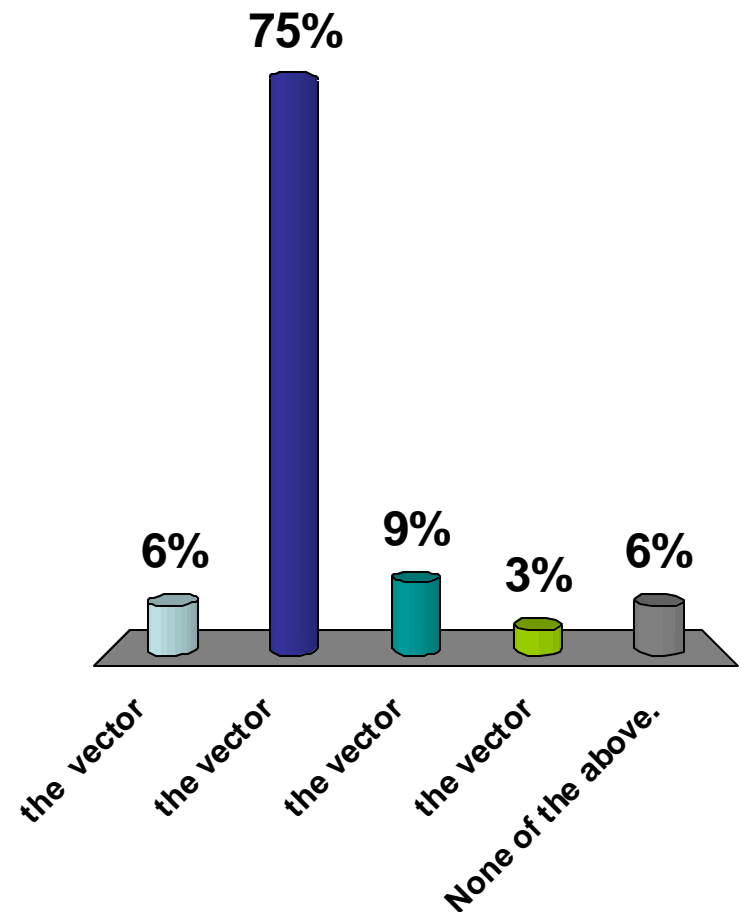
3. The angle between the tangent to the curve $y = \frac{x+1}{x^2-2}$ at the point where $x=1$, and the x-axis is:

1. The angle is $\frac{3\pi}{4}$
2. The angle is $\frac{\pi}{4}$
3. The angle is $\frac{\pi}{2}$
- ✓ 4. The angle is $\arctan(-5)$
5. Non of the above.



4. For the vectors $\vec{OA} = i + j + k$, $\vec{OB} = -2i + 3j - 4k$

1. the vector $\vec{AB} = -i + 4j - 3k$.
- ✓ 2. the vector $\vec{AB} = -3i + 2j - 5k$
3. the vector $\vec{AB} = 3i - 2j + 5k$.
4. the vector $\vec{AB} = -2i + 3j + 4k$.
5. None of the above.



5. The indefinite integral $\int \frac{x}{4+x^2} dx$

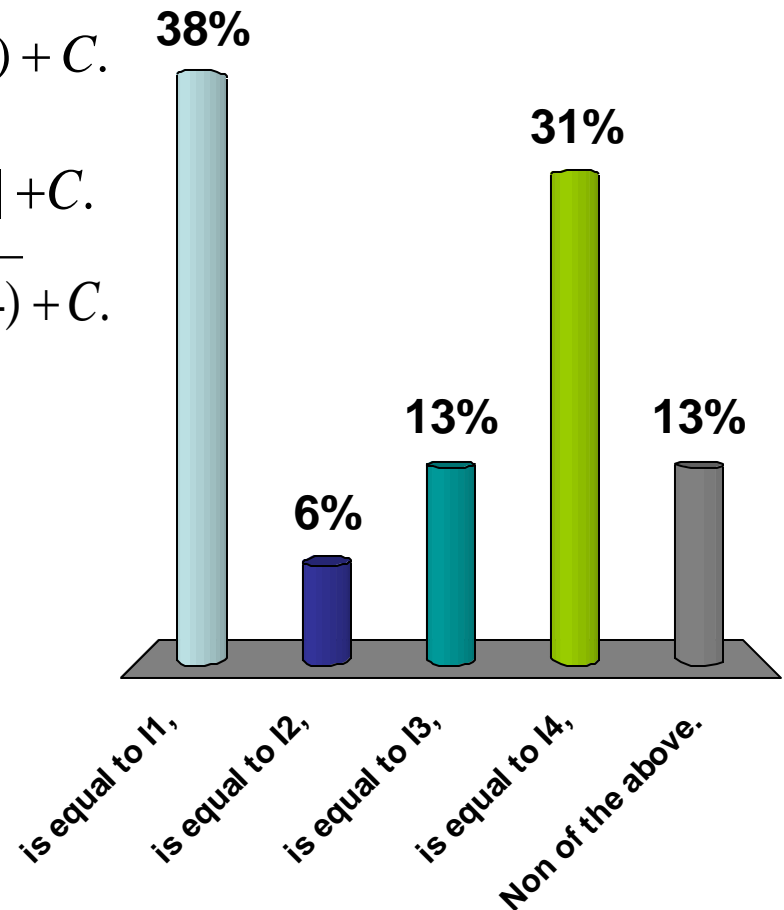
1. is equal to I1, $I_1 = \frac{1}{2} \ln(x^2 + 4).$

2. is equal to I2, $I_2 = \frac{1}{2} \arctan\left(\frac{x}{2}\right) + C.$

3. is equal to I3, $I_3 = \frac{x^2}{8} + \ln|x| + C.$

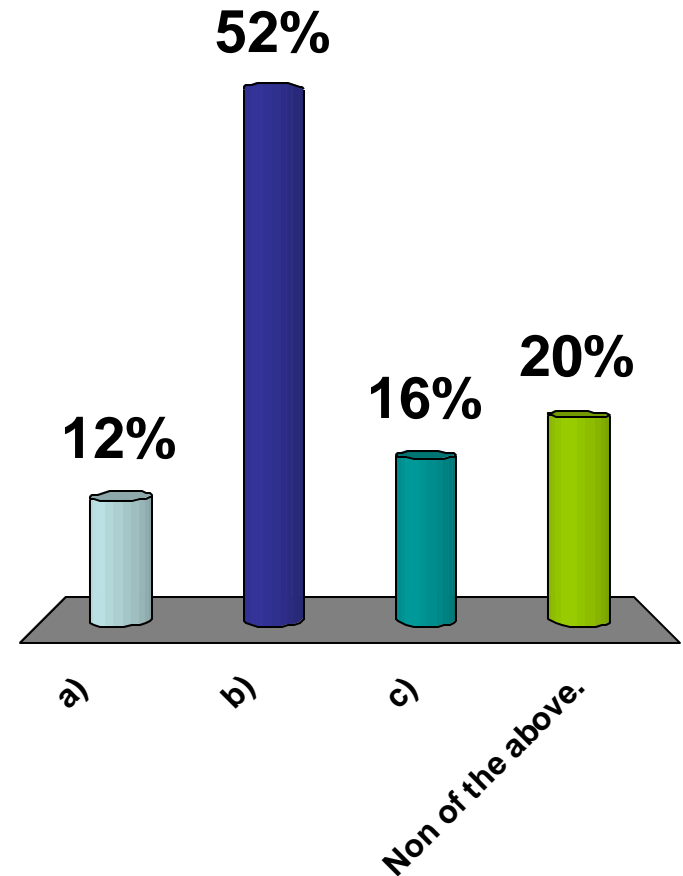
✓ 4. is equal to I4, $I_4 = \ln\sqrt{(x^2+4)} + C.$

5. Non of the above.



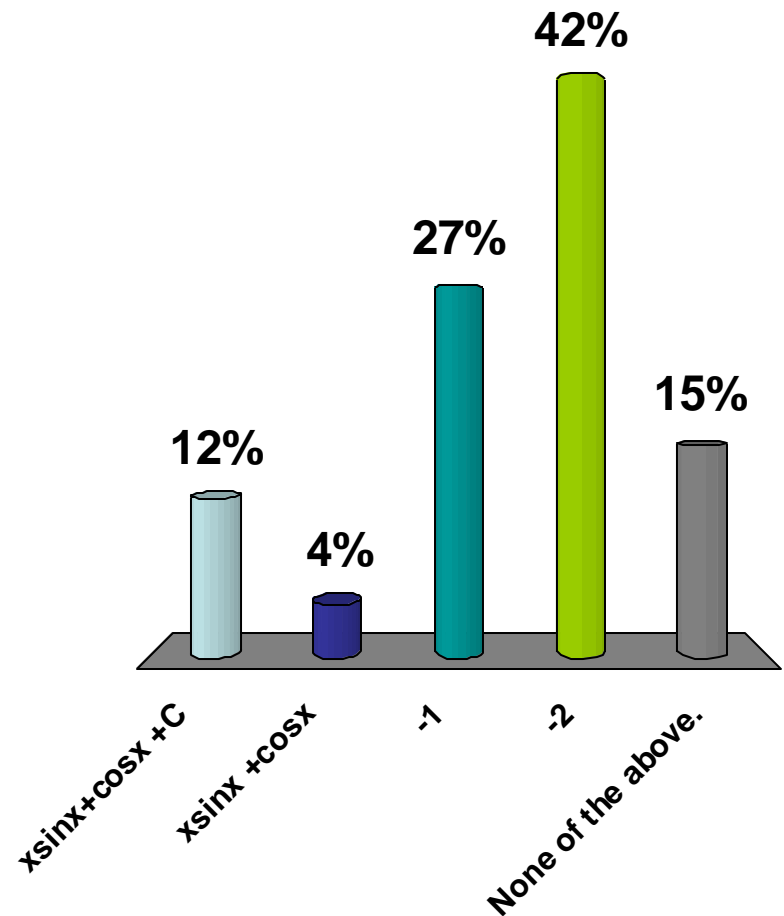
6. The indefinite integral $\int \frac{1}{x^2} \cos\left(\frac{1}{x}\right) dx$ is:

1. a) $\sin(1/x) + C$
- ✓ 2. b) $-\sin(1/x) + C$
3. c) $-(1/x)\sin(1/x) + C$
4. Non of the above.



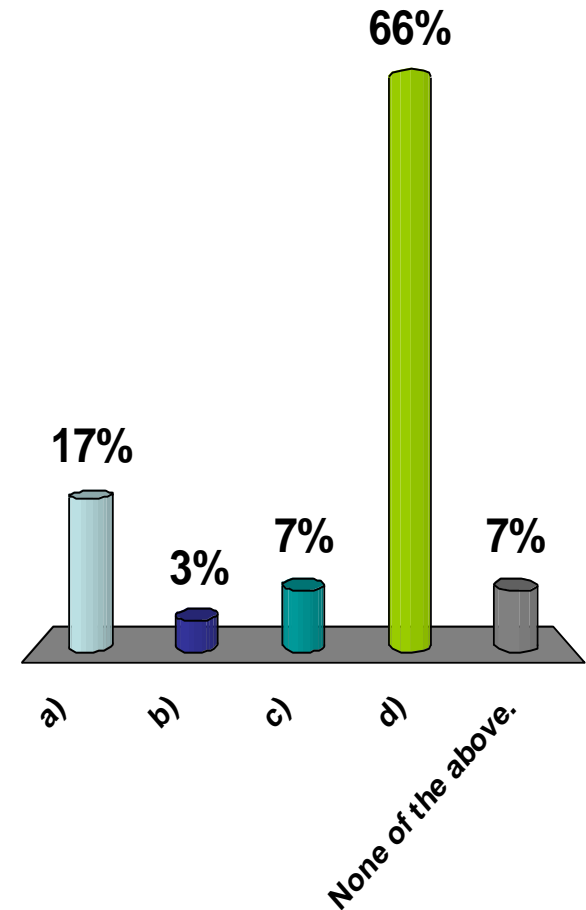
7. The value of the definite integral $\int_0^{\pi} x \cos x dx$ is:

1. $x \sin x + \cos x + C$
2. $x \sin x + \cos x$
3. -1
- ✓ 4. -2
5. None of the above.



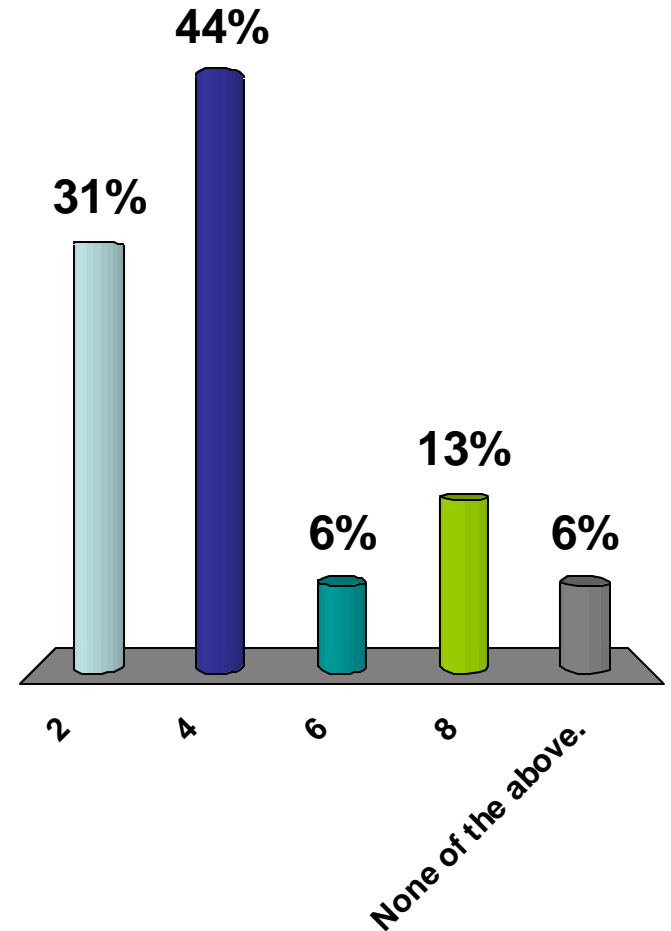
8. The derivative of the function $y = xe^{\sin x}$ is:

1. a) $y' = e^{\cos x}$
2. b) $y' = e^{\sin x} + xe^{\cos x}$
3. c) $y' = e^{\sin x} + x \cos x e^{\cos x}$
- ✓ 4. d) $y' = e^{\sin x} + x \cos x e^{\sin x}$
5. None of the above.



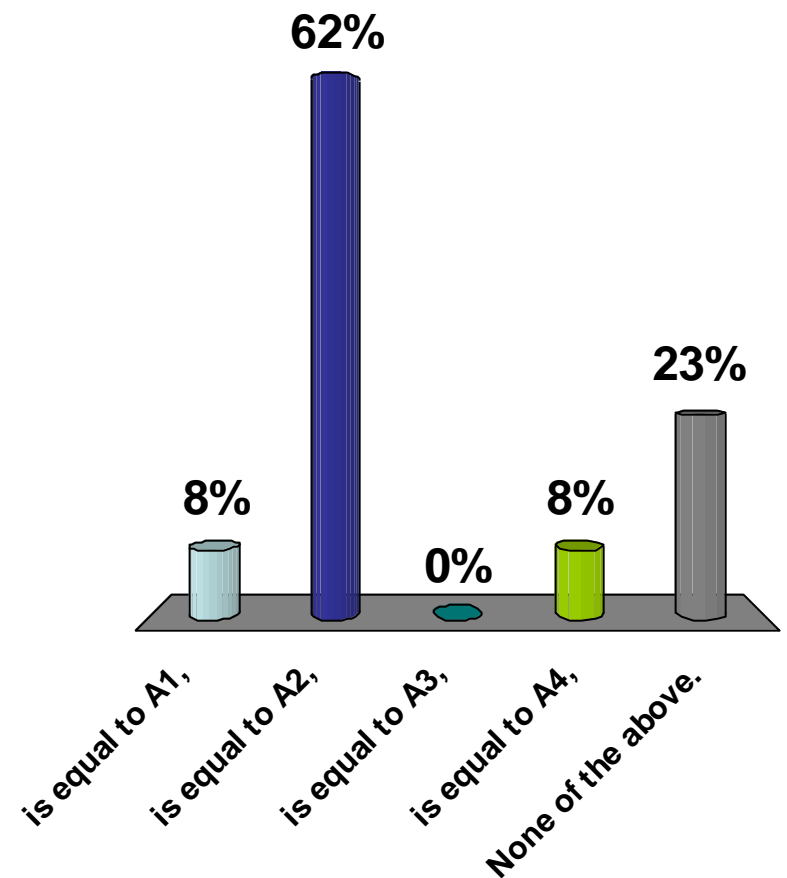
9. The value of the definite integral $\int_0^{2\sqrt{3}} \frac{x}{\sqrt{4+x^2}} dx$

- ✓ 1. 2
- 2. 4
- 3. 6
- 4. 8
- 5. None of the above.



10. The area enclosed between $y=\sin(x)$, $y=\cos(x)$ and $x=\frac{\pi}{2}$

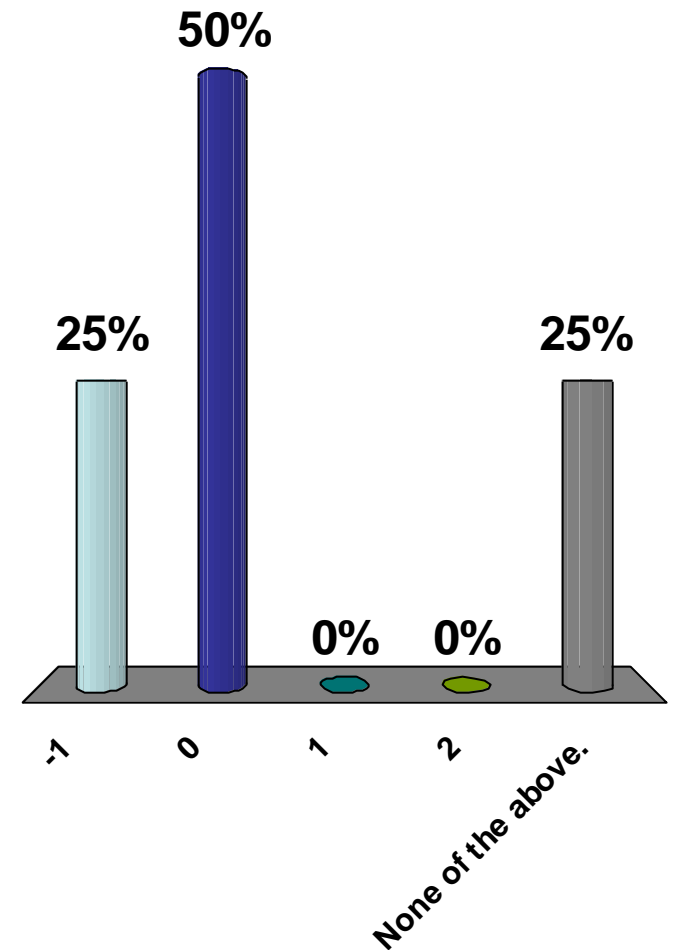
1. is equal to A_1 , $A_1 = \sqrt{2}$.
- ✓ 2. is equal to A_2 , $A_2 = \sqrt{2} - 1$.
3. is equal to A_3 , $A_3 = 1 - \sqrt{2}$.
4. is equal to A_4 , $A_4 = 1$.
5. None of the above.



11. Which of the following is a critical point of

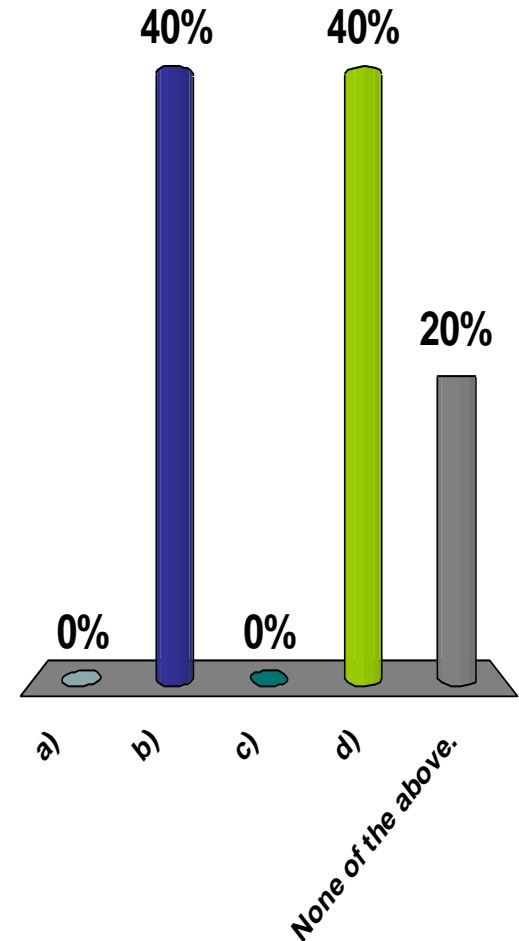
$$f(x) = xe^{-x} ?$$

1. -1
2. 0
- ✓ 3. 1
4. 2
5. None of the above.



12. The derivative of the function y given implicitly by $x^3 - y^3 = 2xy - x + y - 7$

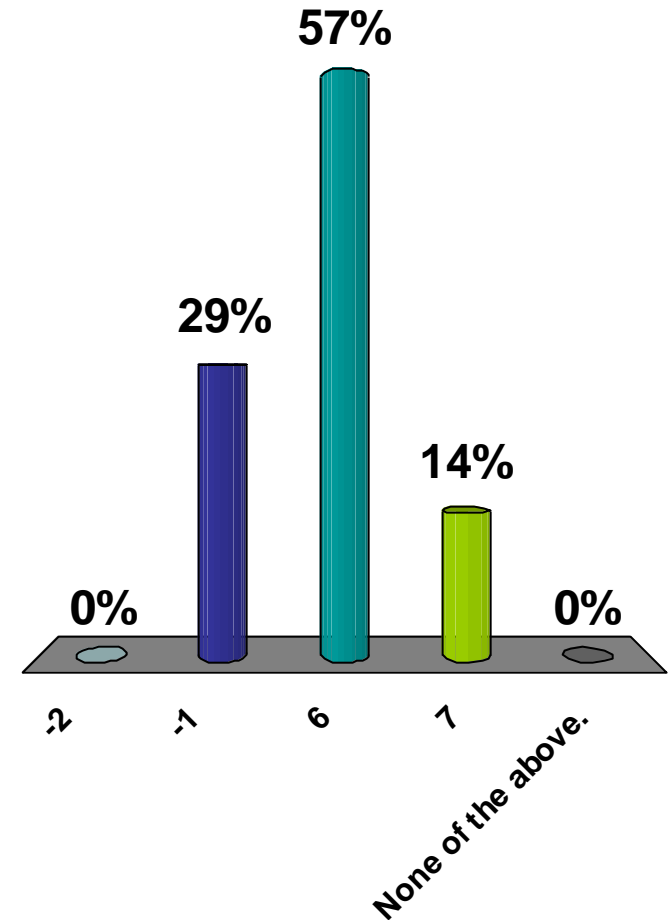
1. a) $\frac{dy}{dx} = 3x^2 - 3y^2 - 2y - x$
2. b) $\frac{dy}{dx} = \frac{3x^2 - 2y - 1}{3y^2 + 2x - 1}$
- ✓ 3. c) $\frac{dy}{dx} = \frac{3x^2 - 2y + 1}{3y^2 + 2x + 1}$
4. d) $\frac{dy}{dx} = \frac{3x^2}{3y^2 + 2x - 1}$
5. None of the above.



13. The determinate of the matrix is:

$$\begin{pmatrix} 1 & -2 & 1 \\ 2 & 0 & -1 \\ 2 & 1 & 0 \end{pmatrix}$$

1. -2
2. -1
3. 6
- ✓ 4. 7
5. None of the above.



Thanks!
Good luck with your exams !

