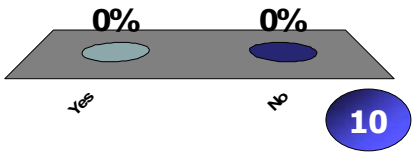
Expansions

Clicker questions

Does the following series converge for $x = 1/2$?

$$\sum_{n=0}^{\infty} x^n$$

✔1. Yes
2. No



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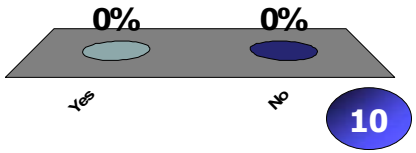
Does the following series converge for $x = 3$?

$$\sum_{n=0}^{\infty} \frac{x^n}{n!}$$

✔1. Yes
2. No



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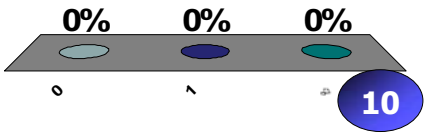
What is the radius of convergence of the following series?

$$\sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}$$

1. 0
2. 1
✔3. ∞



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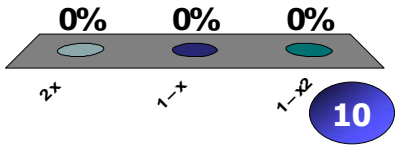
What is the function $p(x)$ for the following Sturm-Liouville equation?

$(1 - x^2)\, y'' - 2\, x\, y' + n\,(n+1)\, y = 0$

1. $2\,x$
2. $1 - x$
3. ✓ $1 - x^2$



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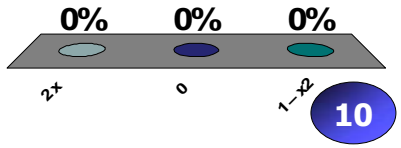
What is the function $q(x)$ for the following Sturm-Liouville equation?

$(1 - x^2)\, y'' - 2\, x\, y' + n\,(n+1)\, y = 0$

1. $2\,x$
2. ✓ 0
3. $1 - x^2$



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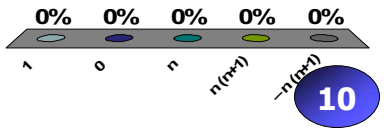
What is the eigenvalue λ for the following Sturm-Liouville equation?

$(1 - x^2)\, y'' - 2\, x\, y' + n\,(n+1)\, y = 0$

1. 1
2. 0
3. n
4. ✓ $n\,(n+1)$
5. $-n\,(n+1)$



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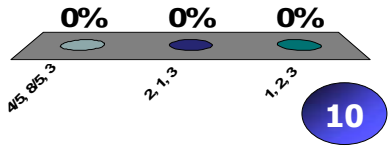
Find the coefficient of the orthonormal expansion of $[1\ 2\ 3]^T$ on the following orthonormal basis $\{[4/5\ \ 3/5\ \ 0]^T, [-3/5\ \ 4/5\ \ 0]^T, [0\ 0\ 1]^T\}$

1. $4/5, 8/5, 3$
2. ✓ $2, 1, 3$
3. $1, 2, 3$



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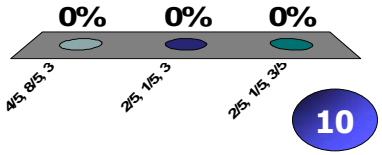
Find the coefficient of the orthogonal expansion of $[1\ 2\ 3]^T$ on the following orthogonal basis $\{[4\ 3\ 0]^T, [-3\ 4\ 0]^T, [0\ 0\ 1]^T\}$

1. 4/5, 8/5, 3
2. ✓ 2/5, 1/5, 3
3. 2/5, 1/5, 3/5



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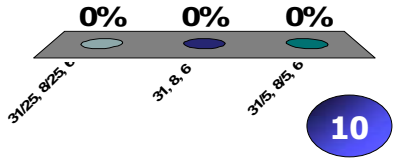
Find the coefficient of the orthogonal expansion of $[4\ 5\ 6]^T$ on the following orthogonal basis $\{[4\ 3\ 0]^T, [-3\ 4\ 0]^T, [0\ 0\ 1]^T\}$

1. ✓ 31/25, 8/25, 6
2. 31, 8, 6
3. 31/5, 8/5, 6



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