

Our Compressor

...Starting equation $\$x^2 + 12x = 73\$$
To complete the square, I need to ... The coefficient of x is 12, so half of that is 6, and squaring it gives 36. $\$x^2 + 12x + 36 = 73 + 36\$$
 $\$x^2 + 12x + 36 = 109\$$
 $(x + 6)^2 = 109$
Taking the square root...
 $x + 6 = \pm\sqrt{109}$
 $x = -6 \pm \sqrt{109}$ which is $\sqrt{109} - 6$
 $a + b = 109 + 6 = 115$
Therefore, $a = 109$ and $b = 6$, so $a + b = 115$.
Substituting $b = 6$ into the second equation: $a + 6^2 - 12*6 = 73$
 $a + 36 - 72 = 73$
 $a - 36 = 73$
 $a = 73 + 36 = 109$ Therefore, $a + b = 109 + 6 = 115$.

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equation $^2 + 12x = 73$ positive solution{a} - b + b quadratic equations $^2 + 12x = 73$ number sides square trinomial coefficient 12 6 36. 73 109 square + $^2 = 109 + 6 = \sqrt{109} - 6 = -6 + \sqrt{109} \sqrt{a} - b - 6 + 6 115 109$ factors 1 109 + 6 = 115{a - b $^2 + 12x - 73$ prime unlikely 144 + 292 = 436 perfect factor form - b + 12b 73 = 73 coefficients equal coefficient zero constant 73 + - 12b 73 equation 6 $^2 - 12*6 = 73 - 109$ \$b 6 + b 109 + 6 = 115 answer 115 \$x{109 - 6 equation Compute $^2 + {109 - 6 145 - 126} = 72 73$ 73 original equation solution correct = 109 = 6 = 115 mistakes answer 115

Our Compressor

we need to find all real numbers k for which there's a nonzero 2-dimensional vector \mathbf{v} such that the matrix multiplied by \mathbf{v} equals $k \mathbf{v}$. First, I remember that..., that means... So, given that the matrix... eigenvalues of a matrix are found by...
 $\det(A - kI) = 0$
...Calculating the determinant... Which simplifies to... Then, the characteristic equation... Therefore, $k = 1 \pm 4$, so $k = 5$ or $k = -3$. So, yes, -3 is indeed an eigenvalue... But the characteristic equation is $(1 - k)^2 - 8X = 0$. So, if $k = -3$, then $(1 - (-3))^2 - 8X = 0 \Rightarrow 16 - 8X = 0 \Rightarrow X = 2$.

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...\\begin 1 & 8 \\\ X & 1...multiplied equals k answer -3...eigenvalue k problem eigenvalues matrix question "find real numbers k nonzero vector \mathbf{v} eigenvalues problem answer -3...original problem find k -3 asking X -3 eigenvalue answer X = 2. value X 2...has eigenvalue k eigenvalues solutions characteristic equation -3 eigenvalue find X characteristic equation...another one problem answer original question find k answer -3 user asking X eigenvalue answer X = 2. X not 2 equation $(1 - k)^2 = 8X$ different solutions -3 eigenvalue substituting k -3 gives X 2. X 2...

(a) R=0.2

(b) R=0.4