Precalculus

Exponent equation that reduces to quadratic, natural base

Todor Milev

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Solve the equation

$$e^{2x} - 3e^x - 4 = 0$$

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Set $e^{x} = u$.

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$$u^2-3u-4=0$$

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$$u^2 - 3u - 4 = 0$$
(?) (?) = 0

Solve the equation

$$e^{2x} - 3e^x - 4 = 0$$

$$u^2-3u-4=0$$

$$(u-4)(u+1)=0$$

Solve the equation

$$e^{2x} - 3e^x - 4 = 0$$

$$u^2 - 3u - 4 = 0$$
$$(u - 4) (u + 1) = 0$$

$$u=4$$
 or $u=-1$

Solve the equation

$$e^{2x} - 3e^x - 4 = 0$$

$$u^2 - 3u - 4 = 0$$

$$(u - 4) (u + 1) = 0$$

$$u = 4$$
 or $u = -1$
 $e^x = 4$ or $e^x = -1$

Solve the equation

$$e^{2x} - 3e^x - 4 = 0$$

$$u^2 - 3u - 4 = 0$$
$$(u - 4) (u + 1) = 0$$

$$u = 4$$
 or $u = -1$
 $e^x = 4$ or $e^x = -1$
 $x = \ln 4$ or no real solution

Solve the equation

$$e^{2x} - 3e^x - 4 = 0$$

$$u^2 - 3u - 4 = 0$$
$$(u - 4) (u + 1) = 0$$

$$u=4$$
 or $u=-1$
 $e^x=4$ or $e^x=-1$
 $x=\ln 4$ or no real solution
 $x\approx 1.3863$