

Thumbnail solutions Only!

#1: $m^2 - 4 \cdot m + 5 = 0$

#2: $\text{SOLVE}(m^2 - 4 \cdot m + 5 = 0, m)$

#3: $m = 2 - i \vee m = 2 + i$

#4: $y = a \cdot e^{(2+i) \cdot x} + b \cdot e^{(2-i) \cdot x}$

#5: $y = e^{2 \cdot x} \cdot (a + b) \cdot \text{COS}(x) + i \cdot e^{2 \cdot x} \cdot (a - b) \cdot \text{SIN}(x)$

#6: $y = \text{RE}(a \cdot e^{(2+i) \cdot x} + b \cdot e^{(2-i) \cdot x}) + \text{RE}(i \cdot (e^{2 \cdot x} \cdot (a + b) \cdot \text{COS}(x) + i \cdot e^{2 \cdot x} \cdot (a - b) \cdot \text{SIN}(x)))$

#7: $y = e^{2 \cdot x} \cdot (a + b) \cdot \text{COS}(x) + \text{RE}(i \cdot (e^{2 \cdot x} \cdot (a + b) \cdot \text{COS}(x) + i \cdot e^{2 \cdot x} \cdot (a - b) \cdot \text{SIN}(x)))$

#8: $y = e^{2 \cdot x} \cdot (a + b) \cdot \text{COS}(x) + e^{2 \cdot x} \cdot (b - a) \cdot \text{SIN}(x)$

#9: $a \cdot \text{SIN}(x) + b \cdot \text{COS}(x)$

#10: $y := a \cdot \text{SIN}(x) + b \cdot \text{COS}(x)$

#11: $\left(\frac{d}{dx}\right)^2 y - 4 \cdot \frac{d}{dx} y + 5 \cdot y$

#12: $4 \cdot (b - a) \cdot \text{COS}(x) + (4 \cdot a + 4 \cdot b) \cdot \text{SIN}(x)$

#13: $\text{SOLUTIONS}([4 \cdot a + 4 \cdot b = 1, 4 \cdot b - 4 \cdot a = 0], [a, b])$

#14: $\left[\left[\frac{1}{8}, \frac{1}{8}\right]\right]$

#15: $y = \frac{1}{8} \cdot \text{SIN}(x) + \frac{1}{8} \cdot \text{COS}(x)$

#16: $y = e^{2 \cdot x} \cdot (a + b) \cdot \text{COS}(x) + e^{2 \cdot x} \cdot (b - a) \cdot \text{SIN}(x) + \frac{1}{8} \cdot \text{SIN}(x) + \frac{1}{8} \cdot \text{COS}(x)$

#17: $y := e^{2 \cdot x} \cdot (a + b) \cdot \text{COS}(x) + e^{2 \cdot x} \cdot (b - a) \cdot \text{SIN}(x) + \frac{1}{8} \cdot \text{SIN}(x) + \frac{1}{8} \cdot \text{COS}(x)$

#18: $\left(\frac{d}{dx}\right)^2 y - 4 \cdot \frac{d}{dx} y + 5 \cdot y = \text{SIN}(x)$

#19: $f(x, y) := x^3 \cdot y + \text{COS}(x \cdot y)$

#20: $\frac{d}{dx} f(x, y) = 3 \cdot x^2 \cdot y - 2 \cdot x \cdot y \cdot \text{SIN}(x \cdot y)$

$d \quad 3 \quad 2 \quad 2$

$$\#21: \frac{d}{dy} f(x, y) = x^2 - x \cdot \sin(x \cdot y)$$

$$\#22: \left(\frac{d}{dx}\right)^2 f(x, y) = -4 \cdot x^2 \cdot y \cdot \cos(x \cdot y) - 2 \cdot y \cdot \sin(x \cdot y) + 6 \cdot x \cdot y$$

$$\#23: \frac{d}{dx} \frac{d}{dy} f(x, y) = -2 \cdot x^3 \cdot y \cdot \cos(x \cdot y) - 2 \cdot x \cdot \sin(x \cdot y) + 3 \cdot x^2$$

$$\#24: \frac{d}{dy} \frac{d}{dx} f(x, y) = -2 \cdot x^3 \cdot y \cdot \cos(x \cdot y) - 2 \cdot x \cdot \sin(x \cdot y) + 3 \cdot x^2$$

$$\#25: z(x, y) := \cos(x)^2 + \sin(y)^2$$

$$\#26: [x(t) := e^t, y(t) := \ln(t)]$$

$$\#27: \text{DIF}(z(x, y), t) = \text{DIF}(z(x, y), x) \cdot \text{DIF}(x, t) + \text{DIF}(z(x, y), y) \cdot \text{DIF}(y, t)$$

$$\#28: x :=$$

$$\#29: y :=$$

$$\#30: \frac{d}{dt} z(x, y) = (-2 \cdot \sin(x) \cdot \cos(x)) \cdot \frac{d}{dt} x + \left(\frac{d}{dy} z(x, y)\right) \cdot \frac{d}{dt} y$$

$$\#31: \frac{d}{dt} z(x, y) = (-2 \cdot \sin(x) \cdot \cos(x)) \cdot \frac{d}{dt} x + (2 \cdot \sin(y) \cdot \cos(y)) \cdot \frac{d}{dt} y$$

$$\#32: \frac{d}{dt} z(x, y) = (-2 \cdot \sin(x) \cdot \cos(x)) \cdot e^t + \frac{(2 \cdot \sin(y) \cdot \cos(y)) \cdot 1}{t}$$

$$\#33: (-2 \cdot \sin(e^t) \cdot \cos(e^t)) \cdot e^t + \frac{(2 \cdot \sin(\ln(t)) \cdot \cos(\ln(t))) \cdot 1}{t}$$

$$\#34: \frac{2 \cdot \sin(\ln(t)) \cdot \cos(\ln(t))}{t} - 2 \cdot e^t \cdot \sin(e^t) \cdot \cos(e^t)$$

$$\#35: f(x, y) := x^2 - y^2 + 2 \cdot x + 3 \cdot y + 3$$

$$\#36: \frac{d}{dx} f(x, y) = 2 \cdot x + 2$$

$$\#37: \frac{d}{dy} f(x, y) = 3 - 2 \cdot y$$

$$\#38: [x = -1, y = 1.5]$$

$$\#39: A := \text{SUBST}\left(\left(\frac{d}{dx}\right)^2 f(x, y), [x, y], [-1, 1.5]\right)$$

$$\#40: A := 2$$

$$\#41: C := \text{SUBST}\left(\left(\frac{d}{dy}\right)^2 f(x, y), [x, y], [-1, 1.5]\right)$$

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#42: C := -2

#43: B := SUBST  $\left( \frac{d}{dx} \frac{d}{dy} f(x, y), [x, y], [-1, 1.5] \right)$ 

#44: B := 0

#45: D := B2 - A·C

#46: D := 4

#47: Saddle

#48: a := [3, -2, 3]

#49: b := [-1, 2, -1]

#50: c := [0, 1, -1]

#51: a · b = -10

#52: a · c = -5

#53: a · (b + c) = -15

#54: SOLUTIONS([1, 1, 1] + s·[2, 3, -2] = [2, 13, -3] + t·[1, -2, 0], [s, t])

#55: [[2, 3]]

#56: [1, 1, 1] + 2·[2, 3, -2] = [5, 7, -3]

#57: [OA := [1, 1, 0], OB := [1, 2, 1], OC := [1, -1, 0]]

#58: OB - OA = [0, 1, 1]

#59: OC - OA = [0, -2, 0]

#60: CROSS([0, 1, 1], [0, -2, 0]) = [2, 0, 0]

#61: (r - OA) · [2, 0, 0] = 0

#62: r :ε Vector

#63: r · [2, 0, 0] - 2 = 0

#64: [x,y,z] · [2,0,0]-2=0

#65: 2·x - 2 = 0

#66: x = 1

#67: A :=  $\begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$ 

#68: B :=  $\begin{bmatrix} -1 \\ 2 \end{bmatrix}$ 

#69: A2 =  $\begin{bmatrix} 7 & 4 \\ 6 & 7 \end{bmatrix}$ 

#70: DET(A) = -5

#71: A·B =  $\begin{bmatrix} 3 \\ -1 \end{bmatrix}$ 

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$$\#72: \begin{bmatrix} 3 \\ -1 \end{bmatrix}, \backslash = [[3, -1]]$$

$$\#73: A := \begin{bmatrix} 1 & 3 & 2 \\ 4 & 1 & -1 \\ 3 & 2 & -3 \end{bmatrix}$$

$$\#74: A^{-1} = \begin{bmatrix} -\frac{1}{36} & \frac{13}{36} & -\frac{5}{36} \\ \frac{1}{4} & -\frac{1}{4} & \frac{1}{4} \\ \frac{5}{36} & \frac{7}{36} & -\frac{11}{36} \end{bmatrix}$$

$$\#75: A * [[x], [y], [z]] = [[1], [0], [2]]$$

$$\#76: [[x], [y], [z]] = A^{-1} * [[1], [0], [2]]$$

$$\#77: [[x], [y], [z]] = [[-11/36], [3/4], [-17/36]]$$

$$\#78: \text{DET}(\text{IDENTITY_MATRIX}(3) - \lambda \cdot A) = 0$$

$$\#79: -36 \cdot \lambda^3 - 21 \cdot \lambda^2 + \lambda + 1 = 0$$

$$\#80: \text{SOLVE}(-36 \cdot \lambda^3 - 21 \cdot \lambda^2 + \lambda + 1 = 0, \lambda)$$

$$\#81: \lambda = -\frac{\sqrt{5}}{6} - \frac{1}{6} \vee \lambda = \frac{\sqrt{5}}{6} - \frac{1}{6} \vee \lambda = -\frac{1}{4}$$

$$\#82: z1 := 1 - \hat{i}$$

$$\#83: z2 := 1 - 2 \cdot \hat{i}$$

$$\#84: z1 \cdot z2 = -1 - 3 \cdot \hat{i}$$

$$\#85: z1 \cdot \text{CONJ}(z1) = 2$$

$$\#86: \text{PHASE}(z1 \cdot z2) = -\text{ATAN}\left(\frac{1}{3}\right) - \frac{\pi}{2}$$

$$\#87: \text{PHASE}(z1 \cdot z2) = -1.892546881$$

$$\#88: \frac{z1}{z2} = \frac{3}{5} + \frac{\hat{i}}{5}$$

$$\#89: \text{PHASE}\left(\frac{z1}{z2}\right) = \text{ATAN}\left(\frac{1}{3}\right)$$

$$\#90: \hat{e}^{\hat{i} \cdot x} = \cos(x) + \hat{i} \cdot \sin(x)$$

$$\#91: \hat{e}^{\hat{i} \cdot \pi} = \cos(\pi) + \hat{i} \cdot \sin(\pi)$$

$$\hat{i} \cdot \pi$$

$$\#92: \hat{e} = \cos(\pi) + i \cdot 0$$

$$\#93: \hat{e}^{i \cdot \pi} = -1 + i \cdot 0$$

$$\#94: \hat{e}^{i \cdot \pi} = -1$$

$$\#95: (\hat{e}^{i \cdot \theta})^4 = (\cos(\theta) + i \cdot \sin(\theta))^4 = \hat{e}^{i \cdot 4 \cdot \theta} = \cos(4 \cdot \theta) + i \cdot \sin(4 \cdot \theta)$$

$$\#96: (\cos(\theta) + i \cdot \sin(\theta))^4 = \text{EXPAND}((\cos(\theta) + i \cdot \sin(\theta))^4)$$

$$\#97: c^4 - 6 \cdot c^2 \cdot s^2 + s^4 + i \cdot (4 \cdot c^3 \cdot s - 4 \cdot c \cdot s^3)$$

$$\#98: \cos(4 \cdot \theta) + i \cdot \sin(4 \cdot \theta) = c^4 - 6 \cdot c^2 \cdot s^2 + s^4 + i \cdot (4 \cdot c^3 \cdot s - 4 \cdot c \cdot s^3)$$

$$\#99: \sin(4 \cdot \theta) = 4 \cdot \cos(\theta)^3 \cdot \sin(\theta) - 4 \cdot \cos(\theta) \cdot \sin(\theta)^3$$

$$\#100: \sin(4 \cdot \theta) = 4 \cdot \cos(\theta) \cdot (1 - \sin(\theta)^2) \cdot \sin(\theta) - 4 \cdot \cos(\theta) \cdot \sin(\theta)^3$$

$$\#101: \sin(4 \cdot \theta) = \cos(\theta) \cdot (4 \cdot \sin(\theta) - 8 \cdot \sin(\theta)^3)$$

$$\#102: i \cdot 2 \cdot x \cdot (x^2 + 1) \cdot \frac{d}{dx} y = \hat{e}^y$$

$$\#103: 2 \cdot x \cdot (x^2 + 1) \cdot \frac{d}{dx} y = \hat{e}^y$$

$$\#104: \int \frac{1}{y} dy = \text{INT} \left(\frac{1}{2 \cdot x \cdot (x^2 + 1)}, x, c \right)$$

$$\#105: -\hat{e}^{-y} = -\frac{\text{LN}(x^2 + 1)}{4} + \frac{\text{LN}(x)}{2} + c$$

$$\#106: -\hat{e}^{-0} = -\frac{\text{LN}(1^2 + 1)}{4} + \frac{\text{LN}(1)}{2} + c$$

$$\#107: -1 = c - \frac{\text{LN}(2)}{4}$$

$$\#108: \text{SOLVE} \left(-1 = c - \frac{\text{LN}(2)}{4}, c \right)$$

$$\#109: c = \frac{\text{LN}(2)}{4} - 1$$

$$\#110: -\hat{e}^{-y} = -\frac{\text{LN}(x^2 + 1)}{4} + \frac{\text{LN}(x)}{2} + \left(\frac{\text{LN}(2)}{4} - 1 \right)$$

$$\#111: \text{SOLVE} \left(-\hat{e}^{-y} = -\frac{\text{LN}(x^2 + 1)}{4} + \frac{\text{LN}(x)}{2} + \left(\frac{\text{LN}(2)}{4} - 1 \right), y \right)$$

$$\#112: y = -\text{LN} \left(\frac{\text{LN} \left(\frac{x^2 + 1}{2} \right)}{4} - \frac{\text{LN}(x)}{2} + 1 \right)$$

$$\#113: \frac{d}{dx} (4 \cdot x \cdot y) = 4 \cdot y$$

$$\#114: \frac{d}{dy} (3 \cdot x + 2 \cdot y^2) = 4 \cdot y$$

$$\#115: f(x, y) = c$$

$$\#116: \frac{d}{dy} f(x, y) = 4 \cdot x \cdot y$$

$$\#117: f(x, y) = 2 \cdot x \cdot y^2 + h(x)$$

$$\#118: \frac{d}{dx} f(x, y) = 3 \cdot x + 2 \cdot y^2$$

$$\#119: f(x, y) = \frac{3 \cdot x^2}{2} + 2 \cdot x \cdot y^2 + g(y)$$

$$\#120: h(x) = \frac{3 \cdot x^2}{2}$$

$$\#121: g(y) = 0$$

$$\#122: \frac{3 \cdot x^2}{2} + 2 \cdot x \cdot y^2 = c$$