11回目レポート課題

番号：　　名前：

出題：令和2年01月10日(金)
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回答欄が足りない場合はレポート用紙に書いて，この用紙とともにステープラーで留めること

1　次の1階微分方程式を解きなさい．ただし，x は t の関数 $x(t)$ とし，$x' = \mathrm{d}x/\mathrm{d}t$ とする．

(1) $x' - 3x = 0,\ x(0) = 2$

解 $x(t) =$

(2) $x' - 2x = \mathrm{e}^{2t},\ x(0) = 3$

解 $x(t) =$

(3) $x' - x = 2\sin t,\ x(0) = 1$

解 $x(t) =$

(4) $x' - 2x = 0,\ x(0) = 3$

解 $x(t) =$

(5) $x' + x = \mathrm{e}^{-t},\ x(0) = 1$

解 $x(t) =$

(6) $x' + 3x = 2\mathrm{e}^{-t},\ x(0) = 1$

解 $x(t) =$

(7) $x' + 2x = \mathrm{e}^{-3t},\ x(0) = 3$

解 $x(t) =$

(8) $x' - 2x = 5\cos t,\ x(0) = 2$

解 $x(t) =$

(9) $x' - x = t,\ x(0) = 2$

解 $x(t) =$

(10) $x' - 2x = t,\ x(0) = 4$

解 $x(t) =$

(11) $x' + x = \mathrm{e}^{2t},\ x(0) = 1$

解 $x(t) =$

(12) $x' - 3x = \mathrm{e}^{t},\ x(0) = 1$

解 $x(t) =$

(13) $x' + 3x = 2\sin 3t,\ x(0) = 1$

解 $x(t) =$

(14) $x' - x = \mathrm{e}^{2t},\ x(0) = -2$

解 $x(t) =$

(15) $x' + 2x = 6t - 1,\ x(0) = 3$

解 $x(t) =$

(16) $x' - 2x = 0,\ x(0) = 3$

解 $x(t) =$

(17) $x' + 3x = 4\mathrm{e}^{t},\ x(0) = 1$

解 $x(t) =$

(18) $x' - x = 2\cos t,\ x(0) = 3$

解 $x(t) =$

(19) $x' + x = U(t-2),\ x(0) = 1$

解 $x(t) =$

[問題は裏面に続く]

2　次の2階微分方程式を解け.

(1) $x'' + x' - 2x = 12t$, $x(0) = 0$, $x'(0) = 6$

解 $x(t) =$

(2) $x'' - 4x = \cos t$, $x(0) = 0$, $x'(0) = 0$

解 $x(t) =$

(3) $x'' + x' - 2x = 3\mathrm{e}^{t}$, $x(0) = 1$, $x'(0) = -1$

解 $x(t) =$

(4) $x'' - 3x = 1$, $x(0) = 1$, $x'(0) = 1$

解 $x(t) =$

(5) $x'' + 2x' + 5x = 0$, $x(0) = 1$, $x'(0) = 0$

解 $x(t) =$

(6) $x'' + 2x' - 3x = \mathrm{e}^{t}$, $x(0) = 1$, $x'(0) = 0$

解 $x(t) =$

(7) $x'' + 4x' + 4x = \sin 2t$, $x(0) = 0$, $x'(0) = 1$

解 $x(t) =$

(8) $x'' + x' - 2x = -12\mathrm{e}^{t}$, $x(0) = 1$, $x'(0) = 0$

解 $x(t) =$

(9) $x'' - x = t$, $x(0) = 1$, $x'(0) = 4$

解 $x(t) =$

(10) $x'' + 2x' = 5\cos t$, $x(0) = 0$, $x'(0) = 2$

解 $x(t) =$

(11) $x'' - x' - 6x = 0$, $x(0) = 1$, $x'(0) = 1$

解 $x(t) =$

(12) $x'' - 3x' + 2x = \mathrm{e}^{t}$, $x(0) = 0$, $x'(0) = 0$

解 $x(t) =$

(13) $x'' - 4x' + 4x = 2\mathrm{e}^{2t}$, $x(0) = 0$, $x'(0) = 1$

解 $x(t) =$

(14) $x'' + 4x = 8\mathrm{e}^{2t}$, $x(0) = 0$, $x'(0) = 0$

解 $x(t) =$

(15) $x'' - 2x = 2$, $x(0) = 0$, $x'(0) = 3$

解 $x(t) =$

(16) $x'' - 4x' + 4x = 0$, $x(0) = 1$, $x'(0) = 1$

解 $x(t) =$

(17) $x'' + 6x' + 10x = 0$, $x(0) = 1$, $x'(0) = 1$

解 $x(t) =$

(18) $x'' + x = 2\sin t$, $x(0) = 2$, $x'(0) = 4$

解 $x(t) =$

(19) $x'' + 2x' + x = t$, $x(0) = 0$, $x'(0) = 0$

解 $x(t) =$

(20) $x''-3x'+2x = U(t-3)$, $x(0) = 1$, $x'(0) = 0$

解 $x(t) =$

(21) $x'' + 4x' - 5x = 0$, $x(0) = 0$, $x'(0) = 1$

解 $x(t) =$

(22) $x'' - 6x' + 9x = 0$, $x(0) = 1$, $x'(0) = 2$

解 $x(t) =$

(23) $x'' - 4x' + 13x = 0$, $x(0) = 2$, $x'(0) = 1$

解 $x(t) =$

(24) $x'' + 3x' - 4x = 6\mathrm{e}^{2t}$, $x(0) = 6$, $x'(0) = 2$

解 $x(t) =$

(25) $x'' + 2x' + 2x = 10\sin 2t$,
$x(0) = -1$, $x'(0) = -3$

解 $x(t) =$

(26) $x'' - 2x' + x = t\mathrm{e}^{t}$, $x(0) = 0$, $x'(0) = 0$

解 $x(t) =$