2002-2003

3.

1. : $\begin{cases} (\ +2)x+7(\ -3)y=35 \\ x+(\ -3)y = \qquad , \ \in \Re \end{cases}$

2. : $\begin{cases} (\ +1)x-2(\ -1)y=3 \\ x+ \quad 3 \ y=4 \ +5 \quad , \ \in \Re \end{cases}$

3. : $\begin{cases} (\ ^2+3 \ -4)x+(1- \ ^2)y=2 \ ^2-3 \ +1 \\ (\ ^2- \ )x+(1- \ )y= \ -1 \qquad , \ \in \Re \end{cases}$

4. : $\begin{cases} x+ y+ z =1 \\ x+ \ y+ z = \qquad , \ \in \Re \\ x+ y+ \ z = \ ^2 \end{cases}$

5. : $\begin{cases} (\ +1)x - \qquad y+ z = \ +2 \\ 3x+(\ -1)y- \ z = \qquad , \ \in \Re \\ x - \qquad y+2z = 2 \end{cases}$

6. : $\begin{cases} (\ +3)x+2 \ y \quad +(3 \ -1)z =0 \\ -3x+2(\ -3)y-(\ +1)z =0 \ , \ \in \Re \\ x+5y+z =0 \end{cases}$

:

4.

7. $\vec{\ }, \vec{\ } \in \Re^2,$ $(\vec{\ }, \vec{\ }) = /4$

$\|\vec{\ }\| = \|\vec{\ }\| = 1.$

$\vec{\ } + 2\vec{\ }$ $\vec{\ } - \vec{\ }$

8. $\vec{\ }, \vec{\ } \in \Re^2.$ $\vec{\ } . \vec{\ } = 0$ $\vec{\ } \perp \vec{\ }.$

9.
$$= \frac{\vec{a} . \vec{b}}{\|\vec{a}\| \, \|\vec{b}\|}$$

10. $\vec{u} = (2,3)$

$\vec{v} = (4,1).$

11. $\vec{u} = (2,2,3,1)$

$\vec{v} = (1,2,1,2).$

12. $\vec{u} = (2,3,4,5)$

$\vec{v} = (2,7,6,8).$

13. $\vec{u} = (\ , \ ), \ \vec{v} = (\ , \ ) \in \Re^2.$

$\left| \quad \right| = 0.$

:

14. $\Re^2$

.

15. $\vec{u}, \vec{v} \in \Re^2$ $\vec{u}, \vec{v}$, $\vec{u}$ $\vec{v}$

.

16.

a. (1,1,2), (1,2,1), (3,1,1).

b. u_1-u_2, u_2-u_3, u_3-u_4, u_4-u_1, u_1,u_2,u_3,u_4.

c. (1,1,0), (1,0,0), (0,1,1),(x,y,z), x,y,z.

17.

$$= \begin{pmatrix} a & b & c \\ 0 & d & e \\ 0 & 0 & f \end{pmatrix}$$

, .

18. , u_1,u_2,u_3

, $w_1= u_1+u_2$, $w_2= u_1+u_3$, $w_3= u_2+u_3$

;

(: $c_1w_1+ c_2w_2+ c_3w_3=0$

c_i .)

:

19. ^{2} .

$_1=\begin{pmatrix}1 & 0\\ 0 & 0\end{pmatrix}$, $_2=\begin{pmatrix}0 & 1\\ 0 & 0\end{pmatrix}$, $_3=\begin{pmatrix}0 & 0\\ 1 & 0\end{pmatrix}$, $_4=\begin{pmatrix}0 & 0\\ 0 & 1\end{pmatrix}$

20. :

$U=\left\{\begin{bmatrix} \\ \\ 0\end{bmatrix} \in \Re^3\right\}$, $W=L\left(\begin{bmatrix}1\\2\\3\end{bmatrix}, \begin{bmatrix}1\\-1\\1\end{bmatrix}\right)$ $U \cap W$.

21. $(\vec{x} - \vec{y}) \perp (\vec{x} + \vec{y})$,

$\|\vec{x}\| = \|\vec{y}\|$.

22. $\vec{u} = \vec{w_1} + \vec{w_2}$, $\vec{w_1}, \vec{w_2}$ $\vec{u} \perp (\vec{w_1} - \vec{w_2})$

23.

$D = k\ p$, k .

, $p = 10$.

	7	8	11	12
	102	95	85	70

(: = D + e)

24. u

$v_1, v_2, \ldots v_n$ $v_1, v_2, \ldots v_n$

$w_1, w_2, \ldots, w_m$. u

$w_1, w_2, \ldots, w_m$.

:

25. $v_1, v_2, \ldots v_m$

$v_1, v_2, \ldots v_m, w$:

$$w = {}^{m}_{i=1} \; {}_i v_i$$

26. F $f : \Re \to \Re$.

F

$\Re$.

27. $W = \{(\; , \; , \;): \; + \; + \; = 0\} \subset \Re^3$. W

$\Re^3$.

28. $W = \{\vec{x} \in \Re^3 : \| \vec{x} \|^2 \leq 1\}$. W

$\Re^3$.

29. V x .

$W = \{ \; \in V \; = \; , \; \}$. W

V.

30. 3x3.

^{3}.

:

31. .

1 .

32. $F_{\Re}$

$\Re$. $= \{\ f(x)= x^2 + x + ,$

$, , \in \Re\}$ $F_{\Re}$.

33. $F_{\Re}$

$\Re$. F_1 $\Re$,

$f'' - 3f = 0$ $F_{\Re}$.

34. $F_{\Re}$

$\Re$. F $\Re$,

$\int f(x)\,dx = 0$ $F_{\Re}$.

35. V x .

$W=\{ \in V \quad ^2 = \ \}$. W .

36. $\vec{e}_1=(1,0,\ldots,0)$, $\vec{e}_2=(0,1,\ldots,0)$, … ,

$\vec{e}_n=(0,0,\ldots,1)$, $\Re^n$.

:

37. V ={f(x)= x+ , , ∈ℜ} ℜ.
$f_1(x)=x$ $f_2(x)=1$ V.

38. V f(x)
4, f(1)=0.
$f_1(x)= x - 1$, $f_2(x)= x^2 - x$, $f_3(x)= x^3- x^2$, $f_4(x)= x^4- x^3$,
V.

39. W={(, , ,)∈$\Re^4$: + =0, =2 }.
dimW=2.

40. V . dimV=n
n+1 .

41. $_2$ 2 x 2 .
$_2$.

42. :

$$\begin{pmatrix} 1 & 2 \\ \\ 1 & 2 \end{pmatrix} \qquad \begin{pmatrix} 1 & 1 \\ \\ 2 & 2 \end{pmatrix}$$

43. V n x m .
dimV=n· m.

:

44. .

F $_{+2}$ = $_{+1}$+ (Fibonacci)

. F.

45. V $\{\vec{u}_1, \vec{u}_2, \ldots, \vec{u}_n\}$, $\{\vec{v}_1, \vec{v}_2, \ldots \vec{v}_n\}$

. $\vec{w} \in V$ $\rightarrow$

w .

46. V′ V

$v_1, v_2, \ldots, v_k \in V$. $v_1, v_2, \ldots, v_k$

,

$\{v_1, v_2, \ldots, v_k\}$ V′.

47. V

$$M(a,b)=\begin{pmatrix} a & b & b & b \\ b & a & b & b \\ b & b & a & b \\ b & b & b & a \end{pmatrix} \quad a,\ b \in \Re$$

V 4

V.

48. V $\Re^4$

$v_1=(1,2,1,3)$, $v_2=(0,2,1,2)$, $v_3=(3,4,2,7)$,

V.

:

49. = { + : , $\in \Re$},

= $\begin{pmatrix} & \\ & \end{pmatrix}$ + =-1 - = -2.

:

i) $_2$.

ii) { , } .

iii) $^{-1} \in$.

50. V ={f(x)= · x+ · x, , $\in \Re$}. V

F

$\Re$.

51. V $\Re^3$

v_1=(1,3,2), v_2=(1,2,-1), v_3=(0,1,3).

52. V $F_{\Re}$

f_1, f_2, f_3 $f_1(x)=e^x$, $f_2(x)$=sinx, $f_3(x)=x^2$.

53. V={(, - , 2 +3): , $\in \Re$}. V

$\Re^3$.

54. V_1, V_2 V. V_1, V_2

$V_1 \subseteq V_2$, V_1=V_2 .

:

55. V_{+1} V

$v_1, v_2, \ldots, v, v_{+1} \in V$ V V

$v_1, v_2, \ldots, v$. $_1, _2, \ldots, \in \Re$:

$$v_{+1} = \sum_{i=1} {}_i v_i$$

$V_{+1} = V$

56. $V=\{(, ,): = = , , , \in \Re\}$ $W=\{(0, ,): , \in \Re\}$.

$\Re^3 = V \oplus W$.

57. $V=\{(, ,0): , \in \Re\}$ $W=\{(0, ,): , \in \Re\}$. $\Re^3 = V+W$

$\Re^3 = V \oplus W$.

58. (

) .

59.

$$F = \begin{pmatrix} 0 & -2 & -10 & -9 & 3 \\ 4 & 1 & -3 & 2 & 8 \\ -1 & 0 & 2 & 1 & -3 \\ -3 & 0 & 6 & 3 & -9 \end{pmatrix}$$