In Exercises 29–34 the matrix A has one real eigenvalue of multiplicity two. Find the general solution of the system $y' = Ay$.

29. $A = \begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}$

30. $A = \begin{pmatrix} -3 & 1 \\ -1 & -1 \end{pmatrix}$

31. $A = \begin{pmatrix} 3 & -1 \\ 1 & 1 \end{pmatrix}$

32. $A = \begin{pmatrix} -2 & -1 \\ 4 & 2 \end{pmatrix}$

33. $A = \begin{pmatrix} -2 & 1 \\ -9 & 4 \end{pmatrix}$

34. $A = \begin{pmatrix} 5 & 1 \\ -4 & 1 \end{pmatrix}$

In Exercises 35–40, find the solution of the initial value problem for system $y' = Ay$ with the given matrix A and the given initial value.

35. The matrix in Exercise 29 with $y(0) = (3, -2)^T$

36. The matrix in Exercise 30 with $y(0) = (0, -3)^T$

37. The matrix in Exercise 31 with $y(0) = (2, -1)^T$

38. The matrix in Exercise 32 with $y(0) = (1, 1)^T$

39. The matrix in Exercise 33 with $y(0) = (5, 3)^T$

40. The matrix in Exercise 34 with $y(0) = (0, 2)^T$

In Exercises 41–48, find the general solution of the system $y' = Ay$ for the given matrix A.

41. $A = \begin{pmatrix} 2 & 4 \\ -1 & 6 \end{pmatrix}$

42. $A = \begin{pmatrix} -8 & -10 \\ 5 & 7 \end{pmatrix}$

43. $A = \begin{pmatrix} 5 & 12 \\ -4 & -9 \end{pmatrix}$

44. $A = \begin{pmatrix} -6 & 1 \\ 0 & -6 \end{pmatrix}$

45. $A = \begin{pmatrix} -4 & -5 \\ 2 & 2 \end{pmatrix}$

46. $A = \begin{pmatrix} -6 & 4 \\ -8 & 2 \end{pmatrix}$

47. $A = \begin{pmatrix} -10 & 4 \\ -12 & 4 \end{pmatrix}$

48. $A = \begin{pmatrix} -1 & 5 \\ -5 & -1 \end{pmatrix}$

In Exercises 49–56, find the solution of the initial value problem for system $y' = Ay$ with the given matrix A and the given initial value.

49. The matrix in Exercise 41 with $y(0) = (3, 1)^T$

50. The matrix in Exercise 42 with $y(0) = (3, 1)^T$

51. The matrix in Exercise 43 with $y(0) = (1, 0)^T$

52. The matrix in Exercise 44 with $y(0) = (1, 0)^T$

53. The matrix in Exercise 45 with $y(0) = (-3, 2)^T$

54. The matrix in Exercise 46 with $y(0) = (4, 0)^T$