Tutorial 5 (week 5)

Exercise 10.1

In Exercise 45-48, match the equation with one of the conic sections labelled (*a*)-(*d*).

45. $(x+3)^2 = -2(y-4)$

46. $\dfrac{(x-2)^2}{16} + \dfrac{(y+3)^2}{4} = 1$

47. $\dfrac{(y-3)^2}{16} - \dfrac{(x+1)^2}{9} = 1$

48. $(y-1)^2 = -4(x-2)$

In Exercise 49-60, find an equation of the conic satisfying the given conditions.

49. Parabola, focus (3, 1), directrix $x = 1$

51. Parabola, vertex (2, 2), focus ($\frac{3}{2}$, 2)

53. Parabola, axis parallel to the y-axis, passes through (-3, 2), (0, $-\frac{5}{2}$), and (1, -6)

57. Ellipse, foci (± 1, 2), length of major axis 8

59. Ellipse, centre (2, 1), focus (0, 1), vertex (5, 1)

61. Hyperbola, foci (-2, 2) and (8, 2), vertices (0, 2) and (6, 2)

63. Hyperbola, foci (6, -3) and (-4, -3), asymptotes y + 3 = ± $\frac{4}{3}$ (x -1)

In Exercise 73-78, find the centre, foci, and vertices of the ellipse, and sketch its graph.

74. $2x^2 + y^2 - 20x + 2y + 43 = 0$

76. $2x^2 + y^2 + 12x - 6y + 25 = 0$

In Exercise 79-84, find the centre, foci, vertices, and equations of the asymptotes of the hyperbola with the given equation, and sketch its graph using its asymptotes as a aid.

80. $4x^2 - 9y^2 - 16x - 54y + 79 = 0$

81. $2x^2 - 3y^2 - 4x + 12y + 8 = 0$