$$f(x) - x = -\frac{x}{x^2 + 1} = -\frac{\frac{1}{x}}{1 + \frac{1}{x^2}} \to 0 \quad \text{as} \quad x \to \pm\infty$$

So the line $y = x$ is a slant asymptote.

E. $$f'(x) = \frac{3x^2(x^2 + 1) - x^3 \cdot 2x}{(x^2 + 1)^2} = \frac{x^2(x^2 + 3)}{(x^2 + 1)^2}$$

39. $y = \sin 2x - 2\sin x$

40. $y = \dfrac{\cos x}{2 + \sin x}$

41. $y = 1/(1 + e^{-x})$

42. $y = \ln(\cos x)$

43. $y = x \ln x$

44. $y = e^x/x$

particle is

$$F(x) = -\frac{k}{x^2} + \frac{k}{(x-2)^2} \qquad 0 < x < 2$$

where k is a positive constant. Sketch the graph of the net force

49. $y = xe^{-x^2}$

50. $y = e^x - 3e^{-x} - 4x$

51. The figure shows a beam of length L embedded in concrete walls. If a constant load W is distributed evenly along its length, the beam takes the shape of the deflection curve

0 x 2

53–58 Use the guidelines of this section to sketch the curve. In guideline D find an equation of the slant asymptote.

x^3 1