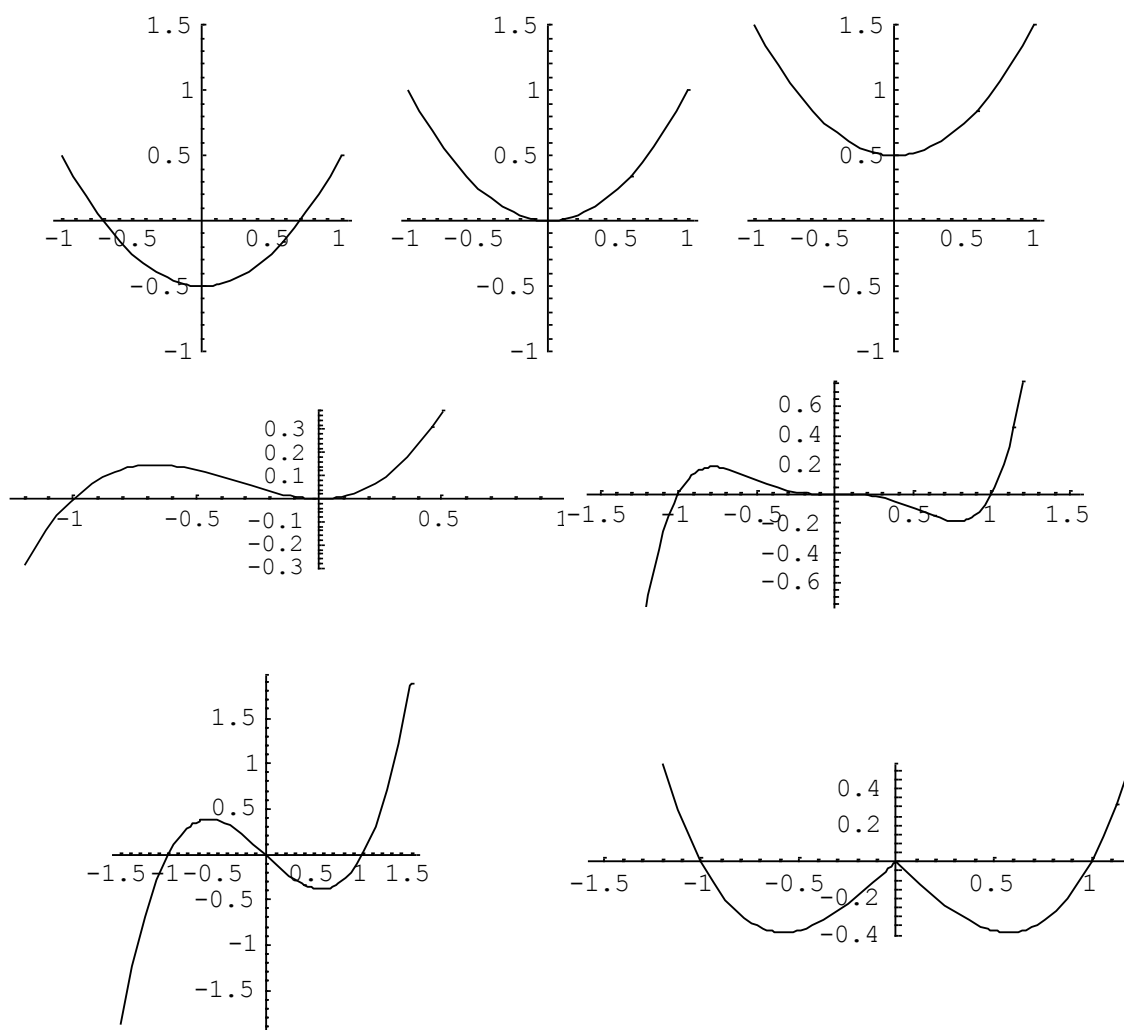
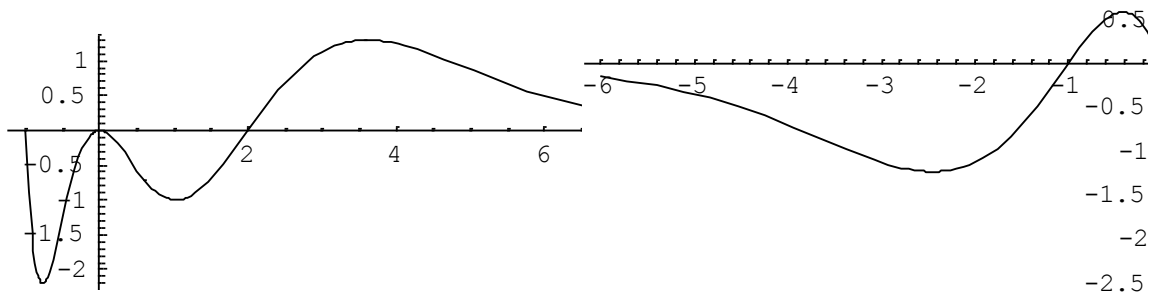


11. Graphical exercises to introduce the integral

PROBLEM 1

The graph of the derivatives of some functions $f(x)$ are found below. Try to have conclusions for the properties of $f(x)$ (minima, maxima, monotonicity, concavity...), and try to plot possible graphs.





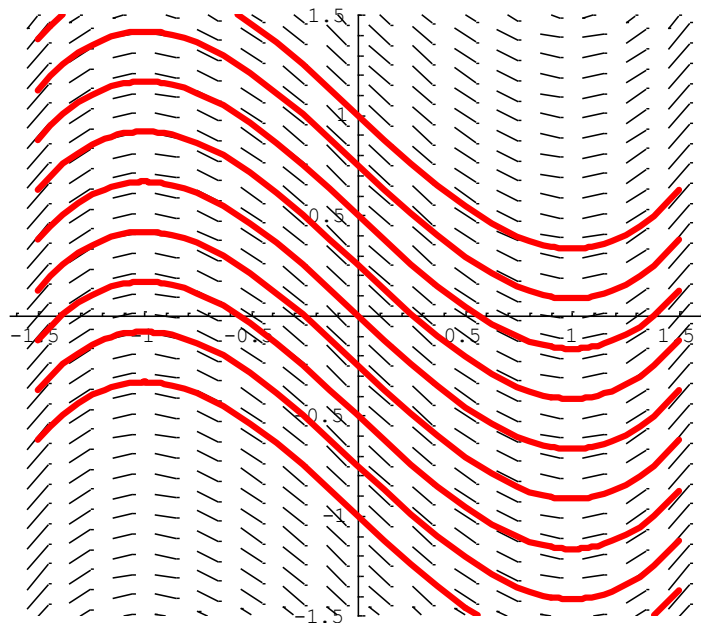
PROBLEM 2

Based on the graph of the derivative $f'(x)$ in the previous problem, plot the tangent field and plot the possible graphs of $f(x)$.

PROBLEM 3

Plot elements (enough number of them) of the tangent field belonging to the following derivatives, and plot the possible functions $f(x)$.

a) $f'(x) = x^2 - 1$



b) $f'(x) = x^2$

c) $f'(x) = x^2 + 1$

d) $f'(x) = x^2(x - 1)$

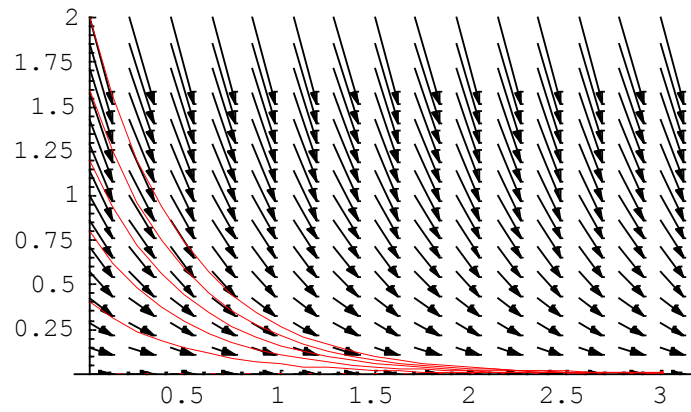
e) $f'(x) = \sin(x)$

f) $f'(x) = e^{-x}$

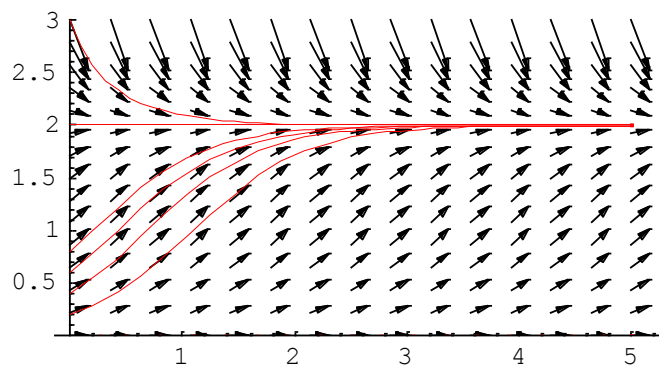
PROBLEM 4

We have the given equations between some functions and their derivatives. Using this equation, plot the tangent field. Find the steady states (constant functions).

a) $c'(t) = -2c(t)$



b) $p'(t) = p(t)(2 - p(t))$



c) $c'(t) = 1 - 2c(t)$

d) $p'(t) = p(t)(2 - p(t)) - 1$

e) $m'(t) = 2(2 - m(t))(4 - m(t))$

f) $p'(t) = p(t)(1 - p(t)) - 0.5$

g) $f'(x) = \sin(x)f(x)$

h) $f'(x) = f^2(x)$