

Problems of Maxima, minima and monotonicity of functions

1) Find out the maxima and minima of these functions:

a) $f(x) = (9x + 45) \cdot e^{x+6}$

b) $f(x) = \sqrt{-3x^2 + 18x - 2}$

c) $f(x) = \frac{-x^2 + x - 3}{x + 2}$

d) $f(x) = (-8x - 48) \cdot e^{x+7}$

e) $f(x) = \sqrt{-2x^2 - 12x + 63}$

f) $f(x) = \frac{x^2 + 2x + 1}{x}$

2) Find out the monotonicity (intervals of increase/decrease) and extrema (maxima and minima) of the following function:

$$f(x) = \frac{13}{x^2 + 3}$$

3) Find out the monotonicity (intervals of increase/decrease) and extrema (maxima and minima) of the following function:

$$f(x) = \frac{x}{x^2 + 2}$$

4) Find out the monotonicity (intervals of increase/decrease) and extrema (maxima and minima) of the following function:

$$f(x) = (x - 8) e^{x-5}$$

5) Find out the monotonicity (intervals of increase/decrease) and extrema (maxima and minima) of the following function:

$$f(x) = \frac{x^2}{x + 1}$$

6) Find out the monotonicity (intervals of increase/decrease) and extrema (maxima and minima) of the following function:

$$f(x) = x^2 - x$$

