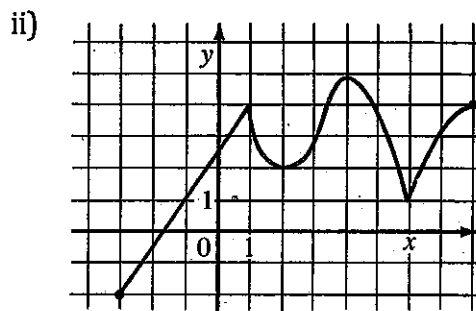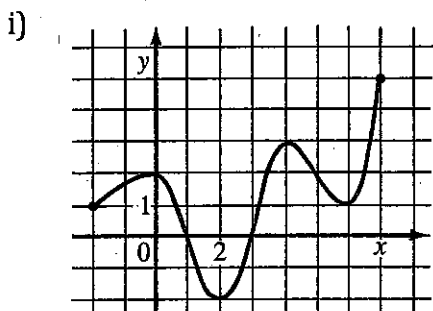Calculus 12
8-4 Maximum and Minimum Values

1. For the functions whose graphs are given, state
a) the absolute maximum value
b) the absolute minimum value
c) the local maximum values
d) the local minimum values

i)

ii)

2. Sketch the graph of each functions and use it to state the absolute and local maximum and minimum values of the function.

a) $f(x) = 3x - 1$, $x > -1$

b) $g(x) = 3x - 1$, $x \geq -1$

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

d) $y = x^2 + 1$, $-1 < x < 2$

e) $y = x^2 + 1$, $-1 \leq x \leq 2$

f) $y = 2 - x^3$

3. Find the critical numbers of the given functions.

a) $f(x) = 17 - 6x + 12x^2$

b) $f(x) = x^3 - 3x + 2$

c) $g(x) = x^4 - 4x^3 - 8x^2 - 1$

d) $g(x) = 3x^4 - 16x^3 + 6x^2 + 72x + 8$

4. Find the absolute maximum value and absolute minimum value of the function.

a) $f(x) = 2x^2 - 8x + 1$, $0 \leq x \leq 3$

b) $f(x) = 3 + 2(x + 1)^2$, $-3 \leq x \leq 2$

c) $f(x) = 2x^3 - 3x^2$, $-2 \leq x \leq 2$

d) $f(x) = 2x^3 - 3x^2 - 36x + 62$, $-3 \leq x \leq 4$

e) $f(x) = x^4 - 2x^2 + 16$, $-3 \leq x \leq 2$

f) $f(x) = x^5 + 3x^3 + x$, $-1 \leq x \leq 2$