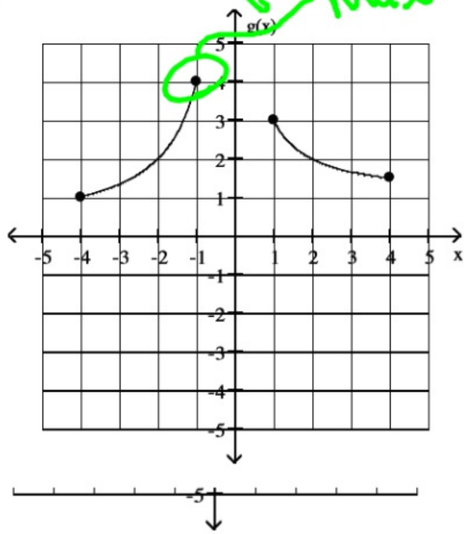
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the location of the indicated absolute extremum for the function.

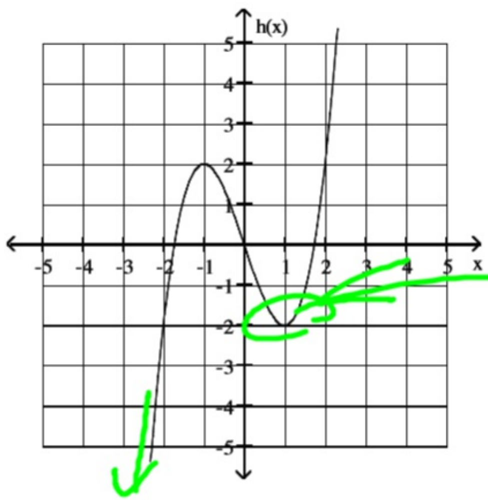
1) Maximum

Abs. Max



1) (-1,4)

2) Minimum



local min., not Absolute...

2) No Abs. Min.

Find the extreme values of the function on the interval and where they occur.

3) $g(x) = -x^2 + 10x - 21$ on $3 \le x \le 7$

③ $g'(x) = -2x + 10 = 0$

$x = 5$

Test $x=4$ | Test $x=6$

g': $+$ | 5 | $-$

max $x = 5$

$g(5) = -(5)^2 + 10(5) - 21$
$= -25 + 50 - 21$
$= 4$

$g(3) = -(3)^2 + 10(3) - 21$
$-9 + 30 - 21 = 0$

$g(7) = -(7)^2 + 10(7) - 21$
$-49 + 70 - 21 = 0$

3) (abs) local max: $(5, 4)$

abs. min 0: $(3,0)$ + $(7,0)$

abs:

Find the extreme values of the function and where they occur.

4) $y = \dfrac{x + 1}{x^2 + 2x + 2}$

4) ____________

$(0, \frac{1}{2})$

Max

$x^2+2x=0$

$x(x+2)=0$

$x=0,-2$

Find the extreme values of the function and where they occur.

4) $y = \dfrac{x + 1}{x^2 + 2x + 2}$

4) ________________

$g = x+1$

$g' = 1$

$f = x^2+2x+2$

$f' = 2x+2$

$$\frac{(x+1)(2x+2)+(1)(x^2+2x+2)}{(x^2+2x+2)^2} = \frac{2x^2+4x+2+x^2+2x+2}{(x^2+2x+2)^2}$$

$$0 = \frac{x^2+2x}{(x^2+2x+2)^2} = y'$$

Tests: $x=-3$; $x=-1$; $x=1$;

Max Min

$+ \quad - \quad +$ y'

$-2 \qquad 0$

it is decreasing.

Give an appropriate answer.

5) Find the value or values of c that satisfy $\frac{f(b) - f(a)}{b - a} = f'(c)$ for the function $f(x) = x + \frac{27}{x}$ on the interval [3, 9].   5) ____________

a b

$f(x) = x + 27^{-1}$

$f(a) = 3 + \frac{27}{3} = 12$

$f(b) = 9 + 3 = 12$

$\frac{12-12}{9-3} = 0$

$f'(c) = 1 - 27c^{-2}$

$0 = 1 - 27c^{-2}$

$= 1 - \frac{27}{c^2}$

$0 = 1 - \frac{27}{c^2}$

$\sqrt{c^2} = \sqrt{27}$

$c = \pm\sqrt{27}$

$= \pm 3\sqrt{3}$

$=$