

Determine the range of the function

A) $f(x) = 4 + x^2$

B) $f(x) = 2 + \sqrt{9-x}$

C) $f(x) = \frac{x^2}{4-x^2}$

D) $f(x) = \frac{3-2x^2}{4+x^2}$

Point of Discontinuity

Makes the
Bottom Zero

Removable (Hole)

Top and Bottom
Zero.

Non-Removable

(Infinite)
(Vertical Asymptote)

Just Bottom Zero

Graph the function and tell whether or not the function has a point of discontinuity at $x = 0$. If there is a discontinuity, tell whether the discontinuity is removable or non-removable.

A) $f(x) = \frac{5}{x}$

Yes Discontinuous

@ $x = 0$

Non-Removable

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

Yes Discontinuous

@ $x = 0$

Removable

C) $f(x) = \frac{|5x|}{x}$

Yes Discontinuous

@ $x = 0$

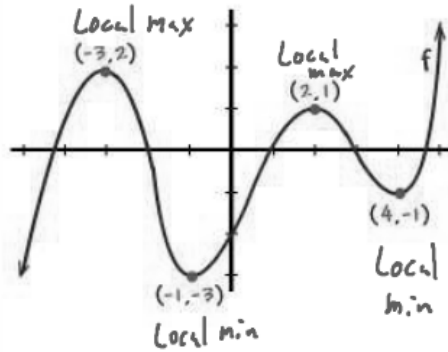
Removable

D) $f(x) = \frac{2x}{x-4}$

Not Discontinuous

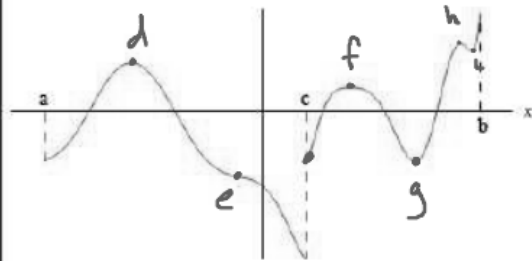
@ $x = 0$

State whether each labeled point identifies a local minimum, a local maximum, or neither. Identify intervals on which the function is decreasing and increasing.



$$\text{Inc: } (-\infty, -3) \cup (-1, 2) \cup (4, \infty)$$

$$\text{Dec: } (-3, -1) \cup (2, 4)$$



$$\text{Inc: } (a, d) \cup (c, f) \cup (g, h) \cup (i, b)$$

$$\text{Dec: } (d, c) \cup (f, g) \cup (h, i)$$

- a - Local min
- b - Local max
- c - Local min
- d - Local max
- e - Neither
- f - Local max
- g - Local min
- h - Local max
- i - Local min

Graph the function and identify intervals on which the function is increasing, decreasing or constant.

30) $f(x) = |x+1| + |x-1| - 3$

33) $g(x) = 3 - (x - 1)^2$

Use your calculator to find all local maxima and minima and the values of x where they occur.

43. $h(x) = -x^3 + 2x - 3$

45) $f(x) = x^2 \sqrt{x+4}$

State whether the function is odd, even, or neither. Support graphically and confirm algebraically.

A) $f(x) = 4x^2$

B) $f(x) = 3x^3$

C) $f(x) = \sqrt{x^4 + 1}$

D) $f(x) = 4x + x^3$

E) $f(x) = 4x + x^2$