

In class - Problem 9 'Quiz

~~A, B~~ a

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

$x > 0$.

For which values of A, B
does $f(x)$ have a minimum?

A Problem 9' Final Review Solution

Solution:

$$f'(x) = -\frac{2A}{x^3} + 2Bx$$

$$f'(x) = 0 \Leftrightarrow \frac{2A}{x^3} = 2Bx$$

$$\Leftrightarrow \frac{A}{B} = x^4.$$

$$\text{Need: } \frac{A}{B} > 0.$$

so: $\text{sign } A = \text{sign } B.$

The critical point occurs at

$$x = \left(\frac{A}{B}\right)^{1/4}$$

It is a minimum if $A, B > 0$

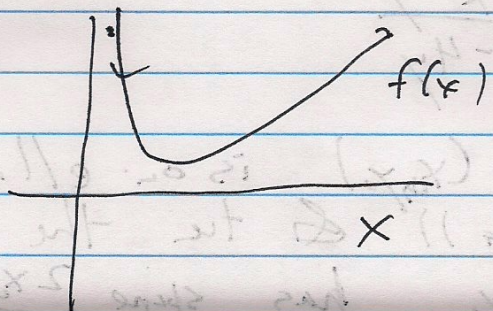
It is a maximum if $A, B < 0$.

why? look at behavior as $x \rightarrow 0$

&

as $x \rightarrow \infty$

$A, B > 0$



$A, B < 0$

