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**Lecture**Lecture questions due Oct 18,  
2016 at 19:30 IST**Recitation****Problem Set 6**Homework 6 due Oct 18, 2016 at  
19:30 IST

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## Problem 1

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### PART A

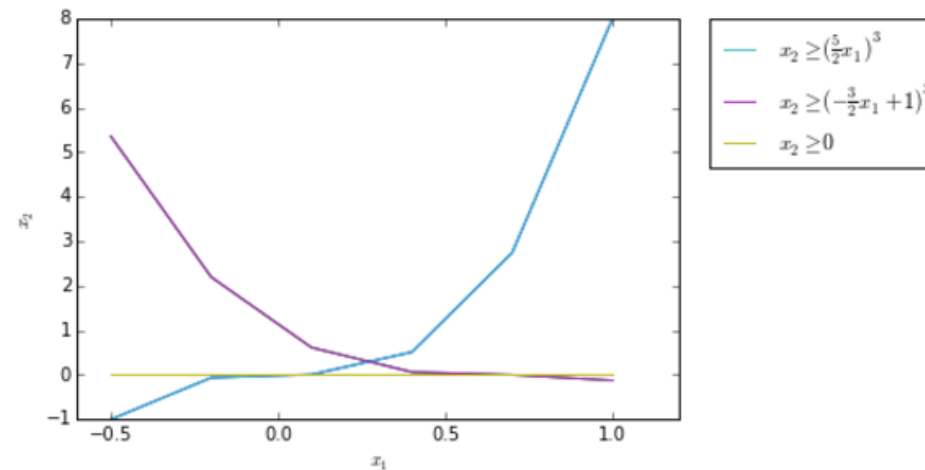
0 points possible (ungraded)

Consider the following nonlinear constrained minimization problem:

$$\begin{array}{ll}
 \min & \sqrt{x_2} \\
 \text{s.t.} & \\
 & x_2 \geq \left(\frac{5}{2}x_1\right)^3 \\
 & x_2 \geq \left(-\frac{3}{2}x_1 + 1\right)^3 \\
 & x_2 \geq 0
 \end{array}
 \left. \vphantom{\begin{array}{l} \min \\ \text{s.t.} \end{array}} \right\}$$

A plot can be found below

► Exit Survey



*Hint: Several algorithms will work, but we suggest the method of moving asymptotes, the details of which are not necessary to understand for the time being.*

To two decimals, what is the objective value?

You can solve using spreadsheet optimization or using Julia. If you use Julia, you will need the following additional syntax

```
Pkg.add("NLOpt")
yourModelVariable=Model(solver=NLOptSolver(algorithm=:LD_MMA))
@NLobjective(yourModelVariable, Max/Min, Function)
@NLconstraint(yourModelVariable, Inequality))
setvalue(variable, initialValue)
```

✓ Answer: 0.49

0.49

**Solution**

See R6\_P1\_sol.ipynb for the Julia solution

See R6P1\_sol.xlsx for the Excel solution

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