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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Data Science for Engineers (course)

Course outline

- How does an NPTEL online course work?
- Setup Guide
- Pre Course Material
- Week 0
- Week 1
- Week 2
- Week 3
- Week 4
  - Optimization for Data Science (unit?unit=56&lesson=57)
  - Unconstrained Multivariate Optimization (unit?unit=56&lesson=58)
  - Unconstrained Multivariate Optimization (

Week 4: Assignment 4

The due date for submitting this assignment has passed.

Due on 2021-09-01, 23:59 IST.

Assignment submitted on 2021-08-31, 19:40 IST

1) If $f(x) = 3x^4 - 2x^3 - 3x^2 + 6$, then the first order necessary condition for either maxima or minima of $f(x)$ is *1 point*

- $6x^3 - 3x^2 - 6x = 0$
- $12x^3 - 6x^2 - 6x = 0$
- $12x^3 - 9x^2 - 6x = 0$
- None of the above

Yes, the answer is correct.
Score: 1
Accepted Answers:
$12x^3 - 6x^2 - 6x = 0$

2) For the function $f(x) = 3x^4 - 2x^3 - 3x^2 + 6$, which of the following point(s) is/are stationary point(s) of $f(x)$? *1 point*

- $-\frac{1}{2}$
- 0
- 1

$\frac{1}{2}$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$-\frac{1}{2}$
0
1

3) For the function $f(x) = 3x^4 - 2x^3 - 3x^2 + 6$, the stationary point(s) which maximize(s) the value of $f(x)$ is *1 point*

- [ ] $-\left(\frac{1}{2}\right)$
- [x] 0
- [ ] 1
- [ ] $\left(\frac{1}{2}\right)$

Yes, the answer is correct.
Score: 1

Accepted Answers:
0

4) For the function $f(x) = 3x^4 - 2x^3 - 3x^2 + 6$, the stationary point(s) which minimize(s) the value of $f(x)$ is *1 point*

- [x] $-\left(\frac{1}{2}\right)$
- [ ] 0
- [x] 1
- [ ] $\left(\frac{1}{2}\right)$

Yes, the answer is correct.
Score: 1

Accepted Answers:
$-\left(\frac{1}{2}\right)$
1

5) If the objective function, inequality constraints, equality constraints are all linear functions, then the type of optimization problem is: *1 point*

- Non- linear problem
- Quadratic problem

- (●) Linear problem
- ( ) None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Linear problem

6) For any two points x1, and x2 in the range and any $0 < \lambda < 1$, if f(x) is a convex function then: ***1 point***

- (●) $f[\lambda x_1 + (1-\lambda)x_2] \leq \lambda f(x_1) + (1-\lambda)f(x_2)$
- ( ) $f[\lambda x_1 + (1-\lambda)x_2] \geq \lambda f(x_1) + (1-\lambda)f(x_2)$
- ( ) None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
$f[\lambda x_1 + (1-\lambda)x_2] \leq \lambda f(x_1) + (1-\lambda)f(x_2)$

7) Consider an optimization function f(x), if x is the decision variable and f is the function to be minimized, then the type of optimization problem is ***1 point***

- ( ) Constrained optimization
- (●) Unconstrained optimization
- ( ) Discrete optimization
- ( ) None of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
Unconstrained optimization