LINKS

Overview (use of linear programming):   
<https://sciencing.com/five-application-linear-programming-techniques-7789072.html>  
  
<https://towardsdatascience.com/linear-programming-for-data-scientists-e9cf1ddf1331>

OPTIMIZATION (convex optimization is a subset of it)

Optimization (examples of applications)

<https://www.solver.com/examples-optimization-problems>

Convex optimization (linear programming is a subset of it)   
<https://towardsdatascience.com/understand-convexity-in-optimization-db87653bf920>

<https://vitalflux.com/convex-optimization-explained-concepts-examples/>

(the first and last part

are the most interesting for you: "what is convex optimization?" and "what are real-world examples of convex optimizations?")

Convex set, convex function  
<https://medium.com/@jamrozkhan/convex-sets-and-convex-functions-3f331a129e1>

<https://en.wikipedia.org/wiki/Convex_set>

<https://en.wikipedia.org/wiki/Convex_function>

Exercises:   
<https://mjo.osborne.economics.utoronto.ca/index.php/tutorial/index/1/cv1/x>

(not all the exercises are manageable with what we have seen, for example we won't talk about inflection points)

Local min and global min  
<https://vitalflux.com/local-global-maxima-minima-explained-examples/>

Convex problem: local min = global min   
<http://www.zitaoliu.com/cs/ml/optimization/2016/06/19/convex-optimization-local-minima-are-global-minima/>

Exercises (we haven't seen the case of functions with 2 variables) : <https://mjo.osborne.economics.utoronto.ca/index.php/tutorial/index/1/cvn/x>

Linear Programming problems  
<https://geekrodion.medium.com/linear-programming-introduction-e0547f3db30d>

Examples of LPP (how to modelize a linear programming problem?)  
<https://analyticsindiamag.com/how-to-use-linear-programming-in-your-next-data-science-project/>

<https://www.superprof.co.uk/resources/academic/maths/linear-algebra/linear-programming/linear-programming-examples.html>

<https://accounting-simplified.com/management/limiting-factor-analysis/linear-programming/graphical/>

<https://www.purplemath.com/modules/linprog3.htm>

(example of modelization of an LPP with resolution using the graphic method: it is NOT REQUIRED for you to know this method)

VIDEO  
Convex sets and functions:

<https://youtu.be/a_gRfwHUlhQ>

Linear programming introduction:

<https://youtu.be/Uo6aRV-mbeg>

Modelization of an LPP:

<https://youtu.be/uJFiR0DG2Bw>

Standard form vs canonical form  
<http://web.mit.edu/lpsolve/doc/LPBasics.htm>

(first part)

SIMPLEX METHOD  
<https://www.matem.unam.mx/~omar/math340/simplex-intro.html>(intro to the simplex method)   
<https://medium.com/@geekrodion/linear-programming-preparation-for-simplex-method-90d6f82ff579> (explanation)  
<https://medium.com/@geekrodion/linear-programming-simplex-method-bc586b9aec10>

(explanation + a Python implementation of the simplex method)  
<https://www.brainkart.com/article/The-Simplex-Method_11205/>

WHY SIMPLEX WORKS  
<http://fdahms.com/2015/01/16/how_the_simplex_works/>

Simplex method at work  
<https://www.optimization101.org/p/lp3.html>

(video of the simplex method at work)

<http://pages.intnet.mu/cueboy/education/notes/algebra/simplex.htm>

(detailed example with all the different steps)

<https://courses.lumenlearning.com/sanjacinto-finitemath1/chapter/reading-solving-standard-maximization-problems-using-the-simplex-method/>

(several detailled examples)

Exercises/course about simplex method

<https://www.zweigmedia.com/RealWorld/tutorialsf4/framesSimplex.html>

<https://www.numerade.com/books/chapter/linear-programmingthe-simplex-method/?section=4912>

<https://pdfslide.net/documents/linear-programming-exercises-week-1-exercise-1-consider-the-.html>

<https://math.libretexts.org/Bookshelves/Applied_Mathematics/Applied_Finite_Mathematics_(Sekhon_and_Bloom)/04%3A_Linear_Programming_The_Simplex_Method/4.02%3A_Maximization_By_The_Simplex_Method/4.2.01%3A_Maximization_By_The_Simplex_Method_(Exercises)>

Standard minimization with the Simplex dual  
<https://courses.lumenlearning.com/sanjacinto-finitemath1/chapter/reading-standard-minimization-with-the-dual/>

Simplex for Minimization (standard form for a minimization problem, dual)  
<https://jaredantrobus.com/teaching/2015/Summer/MA162/4.2.php>

Simplex method and duality for linear minimization problem (includes: definition of the standard form of a minimization LPP, explanations about duality and the simplex, examples and exercises) [most of the last session was based on this source]  
<https://math.libretexts.org/Bookshelves/Applied_Mathematics/Applied_Finite_Mathematics_(Sekhon_and_Bloom)/04%3A_Linear_Programming_The_Simplex_Method/4.02%3A_Maximization_By_The_Simplex_Method/4.2.01%3A_Maximization_By_The_Simplex_Method_(Exercises)>

Special cases in the simplex method (we only talked about degeneracy and unbounded solutions)  
<https://www.brainkart.com/article/Special-Cases-in-the-Simplex-Method_11207/>

Degeneracy and cycling (examples with the "dictionary" version of the simplex but clear)  
<https://www.matem.unam.mx/~omar/math340/degenerate.html>

Standard minimization with the Simplex dual  
<https://courses.lumenlearning.com/sanjacinto-finitemath1/chapter/reading-standard-minimization-with-the-dual/>  
Simplex for Minimization (standard form for a minimization problem, dual)  
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