

| homework    | type:<br>colab or<br>handwritten | similar<br>exercise |                         |   |
|-------------|----------------------------------|---------------------|-------------------------|---|
| ex.4.1.1.a  | handwritten                      | ex.4.1.1.b          | ex.4.1.1.b PDF solution | <a href="http://www-math.ucdenver.edu/~langou/4650/4.1/exercise_ex_4_1_01_b_sauer3/exercise_ex_4_1_01_b_sauer3_sol_langou.pdf">http://www-math.ucdenver.edu/~langou/4650/4.1/exercise_ex_4_1_01_b_sauer3/exercise_ex_4_1_01_b_sauer3_sol_langou.pdf</a> |
| ex.4.1.1.c  |                                  |                     | ex.4.1.1.b colab helper | <a href="https://colab.research.google.com/drive/1QmINOUhGT-UtSpXIJ9VSGUpDS99kDly">https://colab.research.google.com/drive/1QmINOUhGT-UtSpXIJ9VSGUpDS99kDly</a>   |
| ex.4.1.2.a  | handwritten                      | ex.4.1.2.b          | ex.4.1.1.b PDF solution | <a href="http://www-math.ucdenver.edu/~langou/4650/4.1/exercise_ex_4_1_02_b_sauer3/exercise_ex_4_1_02_b_sauer3_sol_langou.pdf">http://www-math.ucdenver.edu/~langou/4650/4.1/exercise_ex_4_1_02_b_sauer3/exercise_ex_4_1_02_b_sauer3_sol_langou.pdf</a> |
|             |                                  |                     | ex.4.1.1.b colab helper | <a href="https://colab.research.google.com/drive/19z_bgBQICaILQA_0w3p6_K4Dg8edxQRm">https://colab.research.google.com/drive/19z_bgBQICaILQA_0w3p6_K4Dg8edxQRm</a>   |
| ex.4.1.8.b  | handwritten                      | ex.4.1.8.a          | ex.4.1.8.a PDF solution | <a href="http://math.ucdenver.edu/~langou/4650/4.1/exercise_ex_4_1_08_a_sauer3/exercise_ex_4_1_08_a_sauer3_sol_langou.pdf">http://math.ucdenver.edu/~langou/4650/4.1/exercise_ex_4_1_08_a_sauer3/exercise_ex_4_1_08_a_sauer3_sol_langou.pdf</a>         |
|             |                                  |                     | ex.4.1.8.a colab helper | <a href="https://colab.research.google.com/drive/1-t_9FiXuS5PlzpZeB3vVY6ixLS_6hf4d">https://colab.research.google.com/drive/1-t_9FiXuS5PlzpZeB3vVY6ixLS_6hf4d</a>   |
| ex.4.1.9.b  | handwritten                      | ex.4.1.9.a          | ex.4.1.9.a PDF solution | <a href="http://math.ucdenver.edu/~langou/4650/4.1/exercise_ex_4_1_09_a_sauer3/exercise_ex_4_1_09_a_sauer3_sol_langou.pdf">http://math.ucdenver.edu/~langou/4650/4.1/exercise_ex_4_1_09_a_sauer3/exercise_ex_4_1_09_a_sauer3_sol_langou.pdf</a>         |
|             |                                  |                     | ex.4.1.9.a colab helper | <a href="https://colab.research.google.com/drive/1_rkgIFPEyktaBG3zKfu6q0lIKwVdZTo8">https://colab.research.google.com/drive/1_rkgIFPEyktaBG3zKfu6q0lIKwVdZTo8</a>   |
| cp.4.1.5    | colab                            |                     | getting started         | <a href="https://colab.research.google.com/drive/13gw6Vwiz6cQix3lElAJtnxC6vhabWkv">https://colab.research.google.com/drive/13gw6Vwiz6cQix3lElAJtnxC6vhabWkv</a>   |
| cp.4.2.6    | handwritten                      |                     |                         | <a href="https://colab.research.google.com/drive/1KQChAXtFm-tQmeb9GvaHJPkNDliarVY">https://colab.research.google.com/drive/1KQChAXtFm-tQmeb9GvaHJPkNDliarVY</a>   |
| cp.4.2.7    | handwritten                      |                     |                         | <a href="https://colab.research.google.com/drive/1DJFK_hsx23JiX1GF4BFuaNKctLG7FoeQ">https://colab.research.google.com/drive/1DJFK_hsx23JiX1GF4BFuaNKctLG7FoeQ</a>   |
| cp.4.2.8    | handwritten                      |                     |                         | <a href="https://colab.research.google.com/drive/15l78g98Fkzl65f_C2uqIC8WCBzK31qT-">https://colab.research.google.com/drive/15l78g98Fkzl65f_C2uqIC8WCBzK31qT-</a>   |
| cp.4.2.9    | colab + handwritten              |                     | getting started         | <a href="https://colab.research.google.com/drive/1juTBllQWf06NjxEzScfy2Cnc4MPUJOS-">https://colab.research.google.com/drive/1juTBllQWf06NjxEzScfy2Cnc4MPUJOS-</a>   |
| ex.4.3.2.b  | handwritten                      |                     |                         |   |
| ex.4.3.7.b  | handwritten                      |                     |                         |   |
| ex.4.3.8.b  | handwritten                      |                     |                         |   |
| cp.4.3.6    | handwritten                      |                     |                         |   |
| cp.4.5.1.b  | colab                            | cp.4.5.1.a          | cp.4.5.1.a colab        | <a href="https://colab.research.google.com/drive/1y0IOFet1piwBMRq1W6tNk-y6UGeTN0L1">https://colab.research.google.com/drive/1y0IOFet1piwBMRq1W6tNk-y6UGeTN0L1</a>   |
| cp.4.5.2.b  | colab                            | cp.4.5.2.a          | cp.4.5.2.a colab        | <a href="https://colab.research.google.com/drive/1Yv1h2tUSi3rnBQl9hMOAcE03-w3MXndV">https://colab.research.google.com/drive/1Yv1h2tUSi3rnBQl9hMOAcE03-w3MXndV</a>   |
| cp.4.5.3.b  | colab                            | cp.4.5.3.a          | cp.4.5.3.a colab        | <a href="https://colab.research.google.com/drive/166O9rVkcLleNyagrZSYiMF_X6VvY1ZGG_">https://colab.research.google.com/drive/166O9rVkcLleNyagrZSYiMF_X6VvY1ZGG_</a>   |
| cp.4.5.4.b  | colab                            | cp.4.5.4.a          | cp.4.5.4.a colab        | <a href="https://colab.research.google.com/drive/1Fnl-aiNY6Umxq6Mq2254K9rS5h-or78w">https://colab.research.google.com/drive/1Fnl-aiNY6Umxq6Mq2254K9rS5h-or78w</a>   |
| cp.4.5.8    | colab                            |                     |                         |   |
| cp.4.5.11.b | colab                            |                     |                         |   |