

## 2017 – 2018 Spring Semester MATH 3050 Section 101 (Barsamian) Suggested Exercises

(All problems from the book *Discrete Mathematics with Applications*, 4<sup>th</sup> Edition, by Susanna Epp)

Section	Suggested exercises
2.1	9,14,16,18,25,27,36,41,48,50
2.2	2,4,7,15,19,20,21,22,23,24,26,30,33,35,41,43
2.3	4,5,6,7,8,14,18,24,27,29,37,38,40,41
3.1	1,4,5,7,12,16,17,19,25,28,30,31,33
3.2	2,3,4,5,12,14,15,19,22,29,32,37,40,42,44,47
3.3	2,3,4,10,11,12,17,19,23,30,41,42,43,44,56,57,58
3.4	4,6,11,12,13,14,19,20,24
4.1	2,5,6,9,13,14,17,20,25,33,35,39,41,43,51,53,54,55,56,57,58,59,60
4.2	2,6,9,11,14,15,16,18,19,20,21,23
4.3	1,2,3,9,11,15,20,26,27,29,36,37,38,47
4.4	2,6,9,10,19,21,22,28,29,30,37,39,40,44,46
4.6	<p>Section 4.6 on Indirect Proofs is a bit of a mess. The book (and many mathematicians) over-uses the method of Proof by Contradiction. I feel that many indirect proofs that are commonly done using contradiction can be more easily done by using the indirect method of simply proving the Contrapositive. And some proofs that are commonly done as proofs by contradiction can actually be proven most clearly with a Direct Proof. So I have particular instructions for the exercises in this section, and many of my particular instructions are different from the book's instructions.</p> <p>Questions about rational and irrational numbers: 4.6 # 2 and these Three Extra Questions:</p> <ol style="list-style-type: none"> <li>1. Suppose that <math>q = a / b</math> is a rational number. What does that tell you about <math>a</math> and <math>b</math>?</li> <li>2. Suppose <math>q = a / b</math> is a rational number and <math>q</math> is zero. What does that tell you about <math>a</math> and <math>b</math>?</li> <li>3. Suppose <math>q = a / b</math> is a rational number and <math>q</math> is non-zero. What's that tell you about <math>a</math> and <math>b</math>?</li> </ol> <p>Exercises to be proven directly, not using contradiction or contraposition: 4.6 # 5,6,7</p> <p>More exercises to be proven directly, not using contradiction or contraposition. 4.6 # 4, 13 (The key to these two exercises is to use Thm 4.4.1 The Quotient Remainder Theorem. Furthermore, on #13, you will need to use two cases: <math>m</math> odd or <math>m</math> even. It is in the even case that you should use the Quotient Remainder Theorem.)</p> <p>Exercises to be proven indirectly, by proving the contrapositive: 4.6 # 10,20,22,24,25,26,27,28</p> <p>Exercises to be proven indirectly, by using the Method of Contradiction: 4.6 # 12,15</p>
4.7	1,2,4,8,11,12,14,15,17,21,22,31
5.1	2,4,10,11,13,16,20,21,22,26,27,30,31,33,35,36,44,45,46,63,64,65,72,74,76,81
5.2	1,3,4,6,8,10,13,20,25,28
5.3	6,7,8,9,10,11,12,13,16,17,19,20,23,29,39
6.1	9,12,13,15,17,18,21,22,23,24,27,30,31,32,35
6.2	1,4,7,13,15,23bcd,28,29,31,32
7.1	2,3,4,6,7,17,18,30,31,32,33,41,42,43,46,47
7.2	4,5,8,9,11,13,17,23,46,47,54
7.3	1,4,11,12,14,16,17,18,19,25,26
8.1	1,3,4,12,13,15,16,21
8.2	4,5,7,8,9,10,11,13,14,15,16,30,32,33
8.3	3,5,15,16a,20,28,29,32,42,44
9.1	3,5,7,9,12,16,18,20
9.2	1,3,6,9,11,12,13,14,16,19,21,22,32,33,34,35,37,38,39,40,41
9.3	1,3,11,13,16,18,23,25,32,35,37,40
9.5	3,5,6,11,16,17,18,19,22,25,27
9.6	1,3,10,11,16,18,19
9.7	1,2,3,5,10,11,13,14,19,20,21,23,25,29,36,43,45,47