

## Homework 1, Math10170, Spring 2015

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Please print this homework and write your answers in the spaces provided. Please staple the pages together and hand the homework in, in class on Mon. Jan 19. Late Homework will not be accepted without a note from a university representative indicating sickness, an emergency or an excused absence.

**Note** For full credit please supply details to justify each answer.

- 1 (a) How many games do we need to schedule for a round robin tournament with 15 competitors?

$$\frac{15 \cdot 14}{2} = 105 \text{ games.}$$

- (b) What is the minimum number of rounds we need to schedule to run such a round robin tournament?

At least 15 rounds are necessary.

- 2 Use the method of scheduling shown in class to draw up a schedule for a round robin tournament with 7 teams. Place the number of the player scheduled to play Player  $i$  in Round  $j$  in Row  $i$ , Column  $j$ .

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7
Player 1	Bye	2	3	4	5	6	7
Player 2	7	1	Bye	3	4	5	6
Player 3	6	7	1	2	Bye	4	5
Player 4	5	6	7	1	2	3	Bye
Player 5	4	Bye	6	7	1	2	3
Player 6	3	4	5	Bye	7	1	2
Player 7	2	3	4	5	6	Bye	1

3 Use the above method of scheduling to schedule a round robin tournament with 8 teams.

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7
<b>Player 1</b>	8	2	3	4	5	6	7
<b>Player 2</b>	7	1	8	3	4	5	6
<b>Player 3</b>	6	7	1	2	8	4	5
<b>Player 4</b>	5	6	7	1	2	3	8
<b>Player 5</b>	4	8	6	7	1	2	3
<b>Player 6</b>	3	4	5	8	7	1	2
<b>Player 7</b>	2	3	4	5	6	8	1
<b>Player 8</b>	1	5	2	6	3	7	4

4 The Six Nations Rugby Championship is a round robin tournament where each team play each other team exactly once (single round round-robin) . The scores from last year's tournament are on the next page.

(a) Fill the scores in the table below with the row player's score first and the column player's score second. The first two games (Feb. 01) have been filled in for the purposes of demonstration. Note each game is recorded twice in the table.

	Ireland	England	Scotland	Wales	France	Italy	Point Differential
<b>Ireland</b>	—	10 – 13	28 – 6	26 – 3	22 – 20	46 – 7	83
<b>England</b>	13 – 10	—	20 – 0	29 – 18	24 – 26	52 – 11	73
<b>Scotland</b>	6 – 28	0 – 20	—	3 – 51	17 – 19	21 – 20	–91
<b>Wales</b>	3 – 26	18 – 29	51 – 3	—	27 – 6	23 – 15	43
<b>France</b>	20 – 22	26 – 24	19 – 17	6 – 27	—	30 – 10	1
<b>Italy</b>	7 – 46	11 – 52	20 – 21	15 – 23	10 – 30	—	–109

(b) When you have completed the task of putting the scores in for each game, calculate the point differential for each team in the last column (points scored by the team minus points scored against the team).











(c) Calculate the number of wins (W), losses (L) and wins minus losses (W-L), for each team in the table below:

	Ireland	England	Scotland	Wales	France	Italy
<b>W</b>	4	4	1	3	3	0
<b>L</b>	1	1	4	2	2	5
<b>W-L</b>	3	3	-3	1	1	-5

<b>Saturday 15th March 2014</b>			
<b>RBS SIX NATIONS</b>			
Italy	11 - 52	England	
Wales	51 - 3	Scotland	
France	20 - 22	Ireland	
<b>Sunday 9th March 2014</b>			
<b>RBS SIX NATIONS</b>			
England	29 - 18	Wales	
<b>Saturday 8th March 2014</b>			
<b>RBS SIX NATIONS</b>			
Ireland	46 - 7	Italy	
Scotland	17 - 19	France	
<b>Saturday 22nd February 2014</b>			
<b>RBS SIX NATIONS</b>			
Italy	20 - 21	Scotland	
England	13 - 10	Ireland	
<b>Friday 21st February 2014</b>			
<b>RBS SIX NATIONS</b>			
Wales	27 - 6	France	
<b>Sunday 9th February 2014</b>			
<b>RBS SIX NATIONS</b>			
France	30 - 10	Italy	
<b>Saturday 8th February 2014</b>			
<b>RBS SIX NATIONS</b>			
Ireland	26 - 3	Wales	
Scotland	0 - 20	England	
<b>Sunday 2nd February 2014</b>			
<b>RBS SIX NATIONS</b>			
Ireland	28 - 6	Scotland	
<b>Saturday 1st February 2014</b>			
<b>RBS SIX NATIONS</b>			
Wales	23 - 15	Italy	
France	26 - 24	England	

5 The Big East mens basketball conference is a double round round-robin tournament where every team plays every other teams exactly twice. The scores to date (the day this homework was made) are shown on the next page.

Calculate the point differential (PD) for each team to date along with wins (W), losses (L) and wins minus losses (W-L) for the tournament up to Jan 10. Record your findings in the table below.

		PD	W	L	W – L
Butler Bulldogs		12	2	1	1
Creighton Bluejays		-26	0	3	-3
DePaul Blue Demons		-4	2	1	1
Georgetown Hoyas		18	2	1	1
Marquette Golden Eagles		3	1	1	0
Providence Friars		-2	2	1	1
Seton Hall Pirates		-5	2	1	1
St John's Red Storm		-22	0	2	-2
Villanova Wildcats		30	2	1	1
Xavier Musketeers		-4	1	2	-1

Date	Game
01/03/15	Seton Hall 66, Villanova 61
	DePaul 71, Xavier 68
	Marquette 75, Providence 66
	Georgetown 76, Creighton 61
	Butler 73, St. John's 69
01/06/15	Georgetown 65, Marquette 59
	Providence 66, Butler 62
	Villanova 90, St. John's 72
01/07/15	DePaul 70, Creighton 60
	Xavier 69, Seton Hall 58
01/10/15	Providence 60, Georgetown 57
	Seton Hall 68, Creighton 67
	Villanova 81, DePaul 64
	Butler 88, Xavier 76