

3. There are 4×4 possibilities, say (left front, right front) where the first left element of the pair is the response of student A and the right element is the response of student B. Of these pairs, only 4 have common elements, e.g., (left front, left front). Assuming that a flat is *equally likely* for all four tires, the probability of a match is $4/16$.
5. Each outcome in the following table is assumed to be *equally likely*. Hence, we count the number of pairs satisfying the condition and divide by the number of possible pairs to find the desired probabilities.

(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

To answer a), construct a table of absolute differences:

0	1	2	3	4	5
1	0	1	2	3	4
2	1	0	1	2	3
3	2	1	0	1	2
4	3	2	1	0	1
5	4	3	2	1	0

To answer b), construct a table of maximums:

1	2	3	4	5	6
2	2	3	4	5	6
3	3	3	4	5	6
4	4	4	4	5	6
5	5	5	5	5	6
6	6	6	6	6	6

The probability that the two numbers differ by 1 or less is $16/36$, and the probability that the maximum of the two numbers will be 5 or greater is $20/36$.

- 8.a) There are three possible outcomes:
 (A) and $P(A) = 1/2$
 (B, A) and $P(B, A) = 1/4$
 (B, B) and $P(B, B) = 1/4$
 (B, B, A, A) and $P(B, B, A, A) = 1/16$
 The probability that Al will win is $3/4$.
- 8.b) There are four possible outcomes:
 (A, A) and $P(A, A) = 1/4$
 (B, A, A) and $P(B, A, A) = 1/8$
 (A, B, A) and $P(A, B, A) = 1/8$
 (B, B, A) and $P(B, A, A) = 1/8$
 The probability that Al will win is $5/8$.

14. Constructing a Venn diagram will help solve the problem, but the key points are that there are $320 - 170 = 150$ women. Of the 160 that went to college, 100 are males, so 60 women went to college. Consequently $150 - 60 = 90$ women did not go to college.

R question 6(a) and (b). R code is available in HMK1.R.

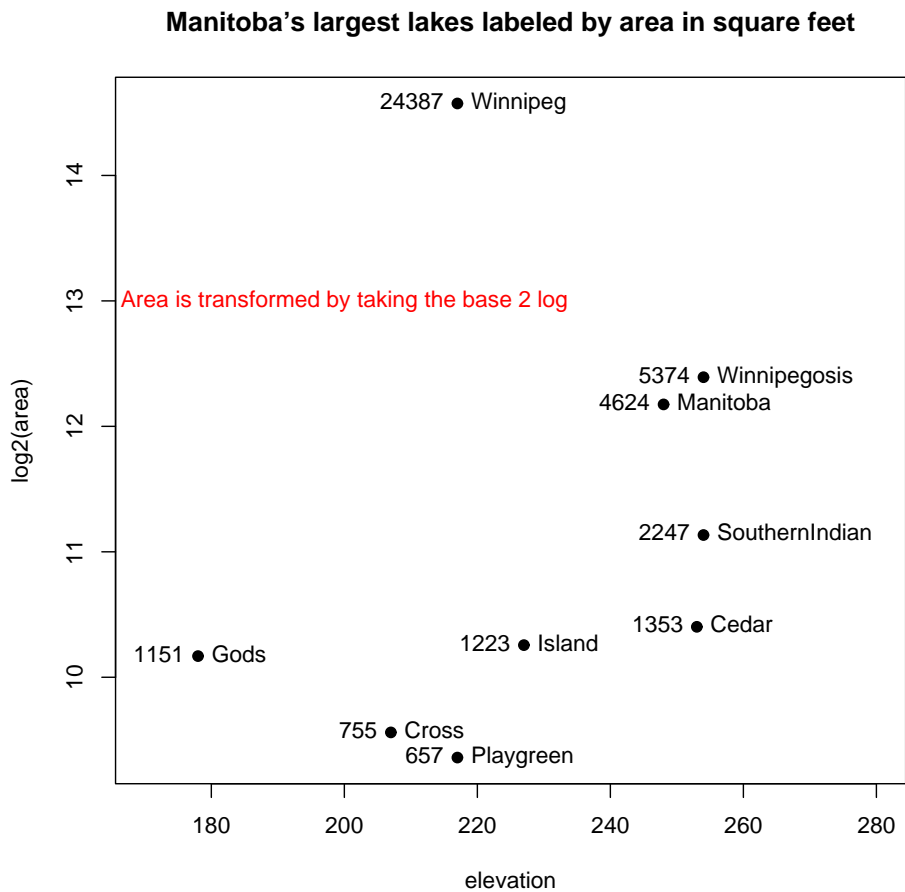


Figure 1: Transformation of area.

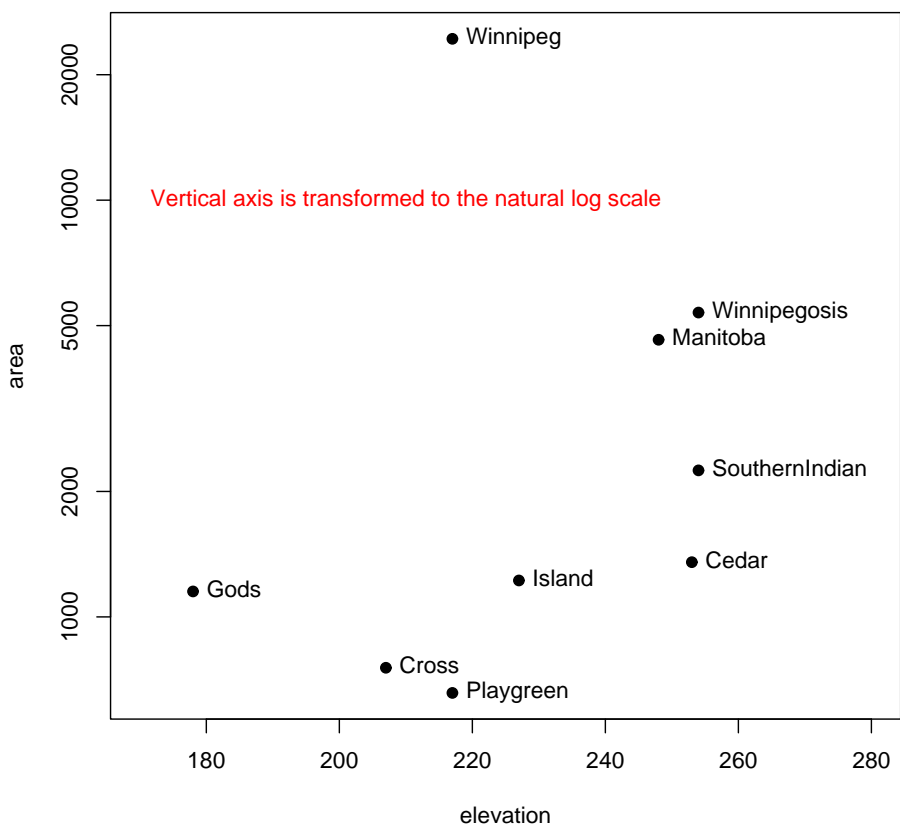


Figure 2: Manitoba's largest lakes labeled by area in square feet. Transformation of vertical scale.