

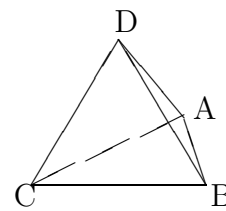
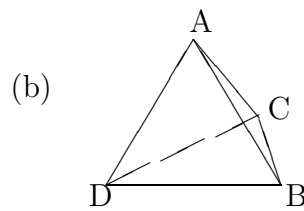
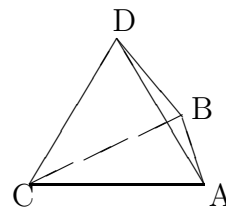
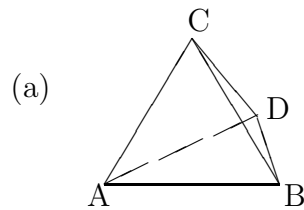
August 4, 2006

Math 035 Assignment #8

Name: _____

Each question is worth 5 points, for a total of 20.

1. For each pair of tetrahedra, determine how many steps it takes to get from one to the other, where at each step you switch the labels on any two vertices. Recalling that each time you perform such a switch, you reverse the orientation of the tetrahedron, use this to determine whether or not the two are equivalent in each case.



2. Determine B , the number of backwards pairs, for each of the following lists:

(a) 3, 1, 4, 5, 9, 2, 6, 8, 7, 10

(b) 2, 7, 1, 8, 4, 6, 10, 3, 9, 5

(c) Say you went from the first list to the second by repeatedly switching two numbers. Would it take you an even or an odd number of switches?

3. The goal of the 15-puzzle is to put it in the configuration shown here:

| | | | |
|----|----|----|----|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | |

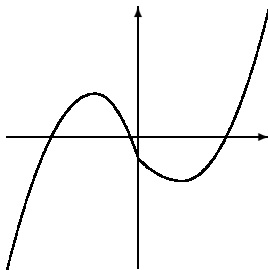
(a) First calculate B , and then A , for the solved position, and then for the position shown below.

| | | | |
|----|---|----|----|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 11 | 10 |
| 7 | | 8 | 12 |
| 13 | 9 | 15 | 14 |

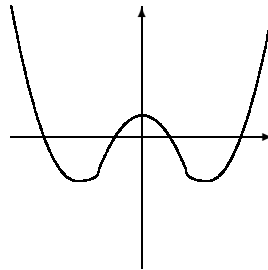
(b) Can the puzzle be solved from this position?

4. For each of the four graphs shown, indicate whether the corresponding polynomial has even or odd degree.

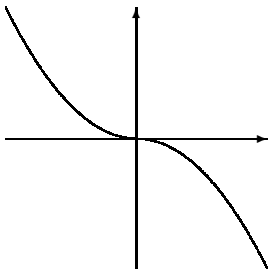
(a)



(b)



(c)



(d)

