

1. Consider the four-member collection of elements A, B, C, D as displayed in the table below under the operation \$.

\$	A	B	C	D
A	C	D	B	A
B	D	C	A	B
C	B	A	D	C
D	A	B	C	D

- a) Is there an identity element in this group? If so, name it and defend your answer. If not, justify. [2]
- b) Does every element have an inverse element? Name them and justify your answer. [3]
- c) Name the **period** of element B (or state that it does not have one) _____ [2]
- d) Is the element C (by itself) a generator of the “group”? How do you know? [3]
- e) Does this collection of elements satisfy the commutative property [3]
2. Consider the silly “12 post snap group” How many different elements would there be? _____ Would you like to create a table for this group? _____ How many different entries would be in such a table? _____ [3 total]

3. Does the set of numbers $\{1, 3, \frac{1}{3}, -3, -\frac{1}{3}\}$ form a group under multiplication? Justify your answer mathematically.

4. Fill in the blanks.

a) The rotation group of a regular hexagon would have _____ elements

b) The reflection group of a non-equilateral, but isosceles triangle has _____ elements.

c) The group formed by the two operations “rotate 20 degrees” and “reflect over the x axis” would have
_____ elements.

5. What is the period of the following element of the 7-post snap group?

