

PreCalc BC**Linear Function Groups****Name:**

Consider the set L of all linear relations with real coefficients (of the form $y=ax+b$), and the operation of composition. **Does (L, \circ) form an abelian group?**

Use the following three members of the set L to illustrate the questions below:

$$f(x) = 2x + 1, \quad g(x) = -x + 3, \quad h(x) = \frac{1}{2}x - 2$$

1. Is $f \circ g$ a member of L ?

2. Does $f(g) = g(f)$?

3. Does $f \circ (g \circ h) = (f \circ g) \circ h$?

4. What is the identity of (L, \circ) ? Demonstrate this.

5. What is h^{-1} ? Is this in L ?

6. Is this a group? Abelian?

7. Describe this set geometrically.