

In the questions below, the operations refer to the operations of addition and multiplication on a projective line after a choice of 0 , 1 and ∞ have been made, as demonstrated in class. We will refer to the line where all this arithmetic is occurring as the ' x -axis'.

1. Given a on the x -axis, show that $a + 0 = a$.
2. Given a on the x -axis, show that $0 + a = a$. Notice that your argument is different in this case!
3. Given a on the x -axis, show how to construct a point b with $a + b = 0$. We'll call that point $-a$.
4. Now show that $(-a) + a = 0$. Your argument should be different!!
5. Given a on the x -axis, show that $a \cdot 1 = a$.
6. Given a on the x -axis, show that $1 \cdot a = a$.