

# Foundations of Mathematics – **Proof Practice**

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Side Notes

*Exercise from Class Handout, Chapter 1.3, Implications.*

Let  $a$ ,  $b$ , and  $c$  be integers, with  $a$  and  $b$  non-zero. If  $(ab) \mid (ac)$ , then  $b \mid c$ .

***Proof.***

Let  $a, b, c \in \mathbb{Z}$  with  $a \neq 0$  and  $b \neq 0$ .

Suppose  $(ab) \mid (ac)$ . Then  $\exists k \in \mathbb{Z}$  s.t.  $ac = (ab)k$ .

Divide both sides of the equation by  $a$ :

$$c = bk.$$

Since  $k \in \mathbb{Z}$ , by definition of divides,  $b \mid c$ .

■

*Question source*

Statemet

***Proof.***

proof

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