Foundations of Mathematics – **Proof Practice**

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Side Notes

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, $b \mid c$.

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Class Handout, Chapter 1.4, Contrapositive and Converse

`Prove that for all real numbers` a `and` b`, if` $a \in \mathbb{Q}$ `and` $ab \notin \mathbb{Q}$`, then` $n \notin Q$.

Proof.

proof

■