

# A Book of Abstract Algebra | (2nd Edition)

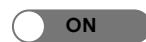


Chapter AB, Problem 3E



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## Problem

*Prove that the following are true for any integers  $a$ ,  $b$ , and  $c$ :*

$1|a$  and  $(-1)|a$ .

## Step-by-step solution

### Step 1 of 3

#### Objective:-

The objective is to prove  $1|a$  and  $(-1)|a$ .

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### Step 2 of 3

Proof:-

The number 1 is factor of each number because on multiply by the number remains same.

Hence, 1 divides each number  $a$ .

$$a = 1 \cdot a \quad \dots (1)$$

Thus, mathematically  $1|a$ .

Proved

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### Step 3 of 3

The number 1 is factor of each number because on multiply by the number remains same.

Hence, 1 divides each number  $a$ .

$$a = 1 \cdot a$$

$$a = (-1)(-1) \cdot a \quad \left\{ \text{since } (-1)(-1) = 1 \right\}$$

$$a = (-1)(-a)$$

$$a = (-1)b \quad \left\{ \text{Let } (-a) = b \right\}$$

Thus, mathematically  $(-1) \mid a$ .

Proved

Proved

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