

Math 270 - Basic Discrete Mathematics
Practice Quiz on Section 4.4
Solutions

Directions: Answer the problems given below.

1. Determine which of the following are true and indicate your answer by circling either True or False.

a. $8|32$

True or False

b. $4|2$

True or False

c. $6|3a^2 \cdot 10b^3$ where a, b are (any) integers.

True or False

d. $99|0$

True or False

2. Prove that for all integers a, b, c , if $a|b$ and $a|c$ then $a|(3b + 4c)$.

Proof: Let a, b, c, d be arbitrary integers and suppose $a|b$ and $a|c$.

Then $\exists k, l \in \mathbb{Z}$ such that $b = k \cdot a$, $c = l \cdot a$.

Then

$$3b + 4c = 3ka + 4la = (3k + 4l)a.$$

Since $k, l \in \mathbb{Z}$, $3k + 4l \in \mathbb{Z}$ by closure, so $a|(3b + 4c)$

by definition. Since a, b, c were arbitrary integers, the result

follows. \square