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Homework 1

Problem: 1

1.)

$$d \mid a \rightarrow a = dk$$

$$d \mid b \rightarrow b = dc$$

$$dk - dc$$

$$d(k - c)$$

Since $k - c \in \mathbb{Z}$ Hence $d \mid a - b$

2.) $m \in \mathbb{Z}$ & $n \in \mathbb{Z}$

$$(ma + nb) \mid d = d$$

$$a = dk$$

$$b = dc$$

$$ma + nb = m(dk) + n(dc) = (mk)d + (nc)d$$
$$= d(mk + nc)$$

since $(mk + nc) \in \mathbb{Z}$ hence $d \mid ma + nb$