

# Review 11

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1. Let  $n, d \in \mathbb{Z}$  with  $d \neq 0$ . We say  $d$  divides  $n$  if  $n = dk$  for some  $k$   
or equivalently  $\frac{n}{d} \in \mathbb{Z}$ .
2. (Transitive property) If  $a|b$  and  $b|c$ , then  $a|c$
3.  $\forall m, n \in \mathbb{Z}$ , if  $a|b$  and  $a|c$ , then  $a|(mb + nc)$ .
4. Division Algorithm

- $11 \text{ Mod } 5 = \underline{1}$   
 $-11 \text{ Mod } 5 = \underline{4}$   
remainder  $\geq 0$

{	<u><math>a \equiv b \pmod{m}</math></u>		e.g. $7 \equiv 1 \pmod{3}$ $\because 3 \mid (7-1)$  $7 = 1 + \underset{\substack{\uparrow \\ k}}{2} \times 3$
	<u>Def</u> $m \mid (a-b)$ ✓		
	<u>Thm</u> $a \text{ Mod } m = b \text{ Mod } m$		
	<u>Thm</u> <u><math>a = b + km</math> for some <math>k</math></u>		