

Math 3120
Chapters 3 and 4 Exam Review

Definitions to memorize: $A \times B$ (pg 132), reflexive, symmetric, transitive (pg 145), $x \equiv y \pmod{m}$ (pg 148), partition (pg 154)

Definitions to match: relation (pg 133), domain, range (pg 135), inverse (pg 138), composition (pg 139), equivalence class (pg 148), antisymmetric (pg 160)

Definitions to know: equivalence relation (pg 147), function, codomain (pg 179), onto (pg 198), one-to-one (pg 201), bijection (pg 203), image, inverse image (pg 208)

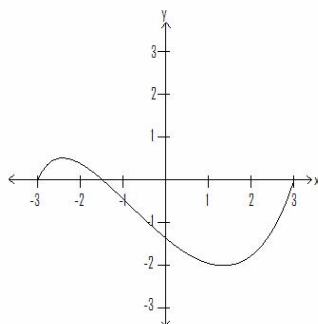
Chapters 3 and 4 Exam Extra credit review problems (15 points, due Monday November 13 in class)

A. Prove Theorem 3.1d (pg 133)

11c (pg 144)

4g, 5 (pg 151)

B. Give the domain and range for the following relation:



C. Let P , Q , and R be relations. True or False?

a. $P \circ Q = Q \circ P$

b. $(P \circ Q) \circ R = P \circ (Q \circ R)$

c. $(P \circ Q)^{-1} = P^{-1} \circ Q^{-1}$.

D. Make an addition table and multiplication table for \mathbb{Z}_7 .

2abc, 3c (pg 158)

E. Give three examples that blow each of the parts of the definition of partition.

1be, 7 (pg 166)

F. Consider the partial order \leq on \mathbb{R} . Give the least upper bound and greatest lower bound of the following sets. State whether the bounds are members of the set itself.

a. $(0, 1]$

b. $\{x \mid x = -\frac{1}{n} \text{ where } n \in \mathbb{N}\}$

2, 6c (pg 186)

3g, 5 (pg 195)

17 (pg 197)

1fj, 2fj, 4, 6 (pg 205)

2abdf (pg 211)

11bc (pg 212)

14bd, 17 (pg 213)

Good luck!