

Section 0, p8 12, 16, 17, 23, 25, 29, 31, 33

12 Let $A = \{1, 2, 3\}$ and $B = \{2, 4, 6\}$. For each relation between A and B given as a subset of $A \times B$, decide whether it is a function mapping A into B . If it is a function, decide whether it is one to one and whether it is onto B .

a. $\{(1, 4), (2, 4), (3, 6)\}$

answer

b. $\{(1, 4), (2, 6), (3, 4)\}$

answer

c. $\{(1, 6), (1, 2), (1, 4)\}$

answer

d. $\{(2, 2), (1, 6), (3, 4)\}$

answer

e. $\{(1, 6), (2, 6), (4, 6)\}$

answer

f. $\{(1, 2), (2, 6), (2, 4)\}$

answer

16 List the elements of the power set of the given set and give the cardinality of the power set.

a. \emptyset

answer

b. $\{a\}$

answer

c. $\{a, b\}$

answer

d. $\{a, b, c\}$

answer

17 Let A be a finite set, and let $|A| = s$. Based on the preceding exercise, make a conjecture about the value of $|\mathcal{P}(A)|$. Then try to prove your conjecture.

In Exercises 23 through 27, find the number of different partitions of a set having the given number of elements.

23. 1 element

answer

25. 3 elements

answer

In Exercises 29 through 34, determine whether the given relation is an equivalence relation on the set. Describe the partition arising from each equivalence relation.

29. $n\mathcal{R}m$ in \mathbb{Z} if $nm > 0$

answer

31. $x\mathcal{R}y$ in \mathbb{R} if $|x| = |y|$

answer

33. $n\mathcal{R}m$ in \mathbb{Z}^+ if n and m have the same number of digits in the usual base ten notation

answer