

# Review 1

Use the following sets to answer questions 1–4.

$$U = \{a, b, c, d, e, f, g, h\}$$

$$A = \{a, b, c, d\}$$

$$B = \{a, c, e\}$$

1.  $A \cup B$
2.  $A \cap B$
3.  $A'$
4.  $(A \cap B)'$
5. List all the subsets of  $W = \{\text{cat}, \text{dog}, \text{fish}\}$
6. Given  $n(U) = 45$ ,  $n(A) = 23$ ,  $n(B) = 13$ , and  $n(A \cup B) = 30$ , find  $n(A \cap B)$ .

Use the following information for questions 7 and 8.

A survey of 320 students led to the responses: 170 liked chewing gum, 200 liked coffee and 112 liked both.

7. How many like gum, but not coffee?
8. How many liked neither?
9. When picking out a username for a particular game the user chooses two letters followed by 3 digits. If letters and digits cannot be repeated, how many usernames are possible?
10. When trying to pick a monitor, a printer, and a scanner for a new computer system, Bill narrowed his choices to 7 printers, 4 monitors, and 3 scanners. How many different ways could Bill set up his system?
11. Compute the value of  $(12 - 7)!$ .
12. Find the value of  ${}_{12}P_3$ .
13. Compute the value of  ${}_{10}C_5$ .
14. In how many ways can you select 5 different colored light bulbs from 8 if order is not important?
15. In how many ways can you select 5 different colored light bulbs from 8 if order is important?

Use the following information to answer questions 16 and 17.

A group of 7 girls and 5 boys must select a team of 4 people. How many teams are possible if the team must consist of

16. one boy and 3 girls?
17. more boys than girls?
18. Using a standard 52 card deck, how many different possible 3 card hands are possible?
19. Which entry of which row of Pascal's Triangle is the value of  ${}_8C_5$ ?
20. Find the number of distinguishable permutations of the letters in the word GLASSES.
21. Given the set  $W = \{w, a, r, d\}$ , how many different two-element subsets does  $W$  have?
22. Give an example of a set that is equivalent but not equal to  $X = \{a, b, c, d\}$ .
23. What is the cardinal number of the set  $\{2, 4, 8, 16, 32, \dots\}$ ?

Use the sets below to respond to questions 24 and 25.

$$W = \{-3, -2, -1, 0, 1, \dots\} \text{ and } E = \{2, 4, 6, 8, 10, \dots\}$$

24. Show that  $W$  and  $E$  are equivalent sets.
25. Find the element in  $E$  that corresponds to  $33 \in W$ .

**Answers** 1.  $\{a, b, c, d, e\}$ , 2.  $\{a, c\}$ , 3.  $\{e, f, g, h\}$ , 4.  $\{a, c, e, f, g, h\}$ , 5.  $\emptyset$ ,  $\{\text{cat}\}$ ,  $\{\text{dog}\}$ ,  $\{\text{fish}\}$ ,  $\{\text{cat}, \text{dog}\}$ ,  $\{\text{cat}, \text{fish}\}$ ,  $\{\text{dog}, \text{fish}\}$ ,  $\{\text{cat}, \text{dog}, \text{fish}\}$ , 6. 6, 7. 58, 8. 62, 9. 468,000, 10. 84, 11. 120, 12. 1320, 13. 252, 14. 56, 15. 6720, 16. 175, 17. 75, 18. 22,100, 19. 8th row 6th entry, 20. 840, 21. 6, 22. answers vary (ex.,  $\{W, X, Y, Z\}$ ), 23.  $\aleph_0$ , 24. answers vary (ex.,  $w \in W$  corresponds to  $2(4 + w) \in E$ ), 25. answers vary (ex., in previous answer, 74 corresponds to 33)