

Exam 1

Remember: Leave me some clues!

1. A survey of local teenagers produced the following results.

54 like Burger King

28 like McDonald's

36 like Wendy's

13 like McDonald's and Wendy's

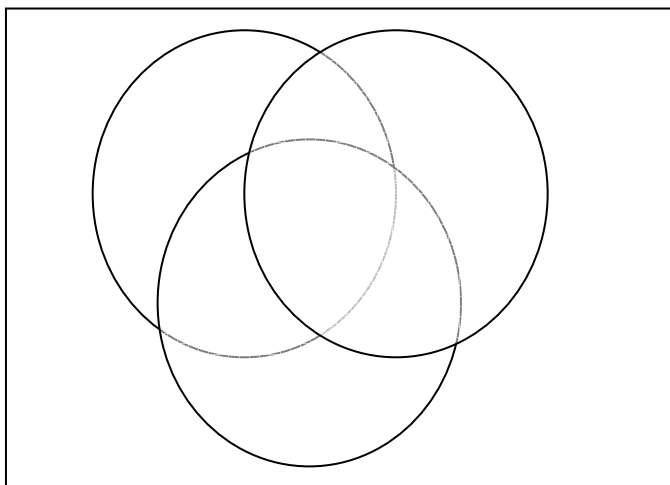
18 like Wendy's and Burger King

12 like McDonald's and Burger King

5 like Burger King, McDonald's and Wendy's

20 do not like any of the three

- a) Construct a Venn diagram to model the above problem.
- b) Find the number of teenagers surveyed.
- c) Find the number of teenagers who like just one of these restaurants.
- d) Find the number of teenagers who like McDonald's only.
- e) Find the number of teenagers who like Burger King or Wendy's.
- f) Find the number of teenagers who like Burger King and Wendy's.
- g) Find the number of teenagers who like at most one of these restaurants,
- h) Find the number of teenagers who like Wendy's and McDonald's but not Burger King.
- i) Find the number of teenagers who like Wendy's or McDonald's but not Burger King.



2. If a , b , and c are digits for which

$$\begin{array}{r} 7a2 \\ -48b \\ \hline c73 \end{array}$$

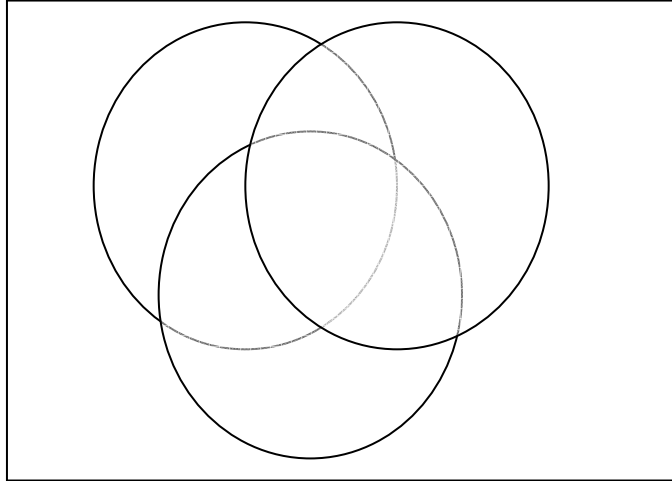
then find what $a + b + c$ equals?

3. Use the method of successive differences to determine the next number in the sequence

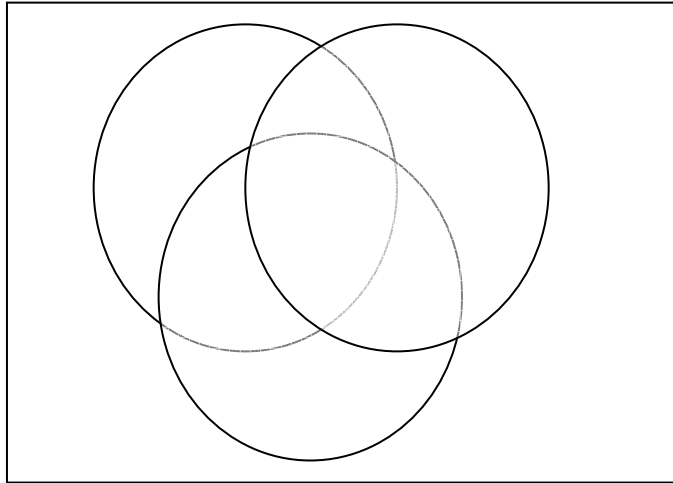
3,19,165,771,2503,6483,14409,...

4. While traveling to his grandmother's for Christmas, George fell asleep halfway through the journey. When he awoke, he still had to travel half the distance that he had traveled while sleeping. For what part of the entire journey had he been asleep?

5. Shade the appropriate region of the Venn diagram.
a) $(A' \cap B') \cup C$



b) $A \cap (B' \cup C)'$



6. If $x \in A \cap B$, must $x \in A \cup B$? Explain your answer.

7. Given the sequence
13, 18, 23, 28, 33, ...

- a) Find the next term.
- b) Find a formula for the nth term.

8. Find the 237th digit in the decimal representation of $\frac{2}{7}$.

9. Find the sum using Gauss' method.

a) $1 + 2 + 3 + 4 + \cdots + 599 + 600 + 601 + 602$

b) $1 + 3 + 5 + 7 + \cdots + 593 + 595 + 597 + 599$

c) $3 + 6 + 9 + 12 + \cdots + 600 + 603 + 606 + 609$

10. Ruth Odom bought a book for \$10 and then spent half her remaining money on a train ticket. She then bought lunch for \$4 and spent half her remaining money at a bazaar. She left the bazaar with \$8. How much money did she start with?

11. Your doctor gives you a prescription instructing you to take one pill every 15 minutes. How many pills will you take during the first half-hour?

12. Let $U = \{a, b, c, d, e, f, g\}$, $A = \{a, e\}$, $B = \{a, b, e, f, g\}$, $C = \{b, f, g\}$, $D = \{d, e\}$.

- a) True False $A \approx D$ (equivalent)
 - b) True False $A = D$
 - c) True False $\emptyset \subseteq A$
 - d) True False $a \in B$
 - e) True False $\emptyset \in A$
 - f) True False $B \subseteq C$
 - g) True False $A \cap \emptyset = A$
 - h) True False $A \cup \emptyset = A$
 - i) True False There are exactly six subsets of C .
- a) How many elements are in $A \times C$?
 - b) List the set $A \times C$?