

16 CHAPTER 2 FORM A

10. Classify each of the following as true or false. If false, tell why or give an example showing that it is not true.

- (a) For all sets A and B , $A - B = B - A$
- (b) For all sets A , $\emptyset \subseteq A$
- (c) For all sets A , $A \subseteq A \cup \emptyset$
- (d) The set $\{r, s, t, \dots, z\}$ is a finite set.
- (e) No set can be equivalent to all of its subsets,

11. In an interview of 50 math majors,

12 liked calculus and geometry

18 liked calculus but not algebra

4 liked calculus, algebra, and geometry

25 liked calculus

15 liked geometry

10 liked algebra but neither calculus nor geometry

2 liked geometry and algebra but not calculus.

Of those surveyed, how many liked calculus and algebra?

12. For each of the following, identify the whole-number properties that are illustrated.

- (a) $2(3 + 4) = 2(4 + 3)$
- (b) $5 + 7 = 7 + 5$
- (c) $1 \cdot 14 = 14 = 14 \cdot 1$
- (d) $5(9 + 3) = 5 \cdot 9 + 5 \cdot 3$
- (e) $2 + (3 + 2) = (2 + 3) + 2$
- (f) $5(3 \cdot 4) = (5 \cdot 3)4$

13. Using the definition of less than or greater than, prove that each of the following inequalities is true.

(a) $5 < 7$

(b) $18 > 14$

14. For each of the following, find all possible whole-number replacements that make the following statements true.

(a) $5 \cdot \square + 27 < 48$

(b) $944 = \square \cdot 48 + 32$

(c) $28 - \square \geq 14$

15. Use the distributive property of multiplication over addition and addition and subtraction facts to rename each of the following, if possible.

(a) $2x + 4x + 7x + 5x$

(b) $6x^3 + 7x^3$

(c) $a(b + c + d)$

16. Jim was paid \$800 a month for his first 6 months of work and then received a \$20 per month raise for his next 6 months. How much money did he make for the year?

17. Sue argued that $0 \div 0 = 1$ because any number divided by itself is 1. What would you tell her?

18 CHAPTER 2 FORM A

18. If q and r are whole numbers such that $109 = 5q - r$ and $0 < r < 5$, find q and r .

19. Assuming that a , b and $a + b$ are whole numbers and $b \neq 0$, explain why $(a + b) \cdot b = a$.

Name: _____
Date: _____ Pd: _____

SOLVING PROBLEMS WITH VENN DIAGRAMS

For each problem, first draw a Venn Diagram. Then answer the question asked.

1. Mr. Siemers was looking for a new gleeper. Of the eleven people that applied for the job, three could neither glop nor pleep, and four could do both. Two could glop, but didn't pleep. How many could pleep but not glop?
2. After their weekly meeting, the members of the Evergreen Math Club went for hot dogs. The club treasurer phoned in the following order. "None of us wants their hot dog plain. Five want mustard, six want relish, and seven want ketchup. Four take both ketchup and relish, three take both ketchup and mustard, and two take both mustard and relish. One takes all three." The poor waiter was lost. Can you figure out how many hot dogs must be prepared?
3. How many students take a shop class if:
 - 22 have wood
 - 20 have metal
 - 24 have drawing
 - 10 have wood and metal
 - 7 have wood and drawing
 - 9 have metal and drawing
 - 1 has all three
4. In a city block 31 people take the Times and 27 take the PI and 3 take both papers. How many papers are delivered in all?
5. Given a choice as to intramurals next quarter, students said that they were interested in a 100 Mile Jogging Club, ping-pong, and pickleball. If:
 - 2 said they wanted to do all three
 - 7 said they wanted to do pickleball and jog
 - 6 said they wanted to do ping-pong and jog
 - 6 said they wanted to do ping-pong and pickleball
 - 19 said they wanted to do ping-pong
 - 20 said they wanted to do jogging
 - 21 said they wanted to do pickleballHow many students turned out in all?
6. One hundred people were surveyed. Sixty-four people preferred blue jeans, thirty-one preferred black jeans, and fifteen preferred neither blue nor black jeans. How many people liked both?
7. In one class, everyone loves winter because they all either downhill ski or snowboard. There are 18 students who like to ski and 14 who like to snowboard. Of these students, 5 like to do both sports. How many students are in the class all together?
8. Fifty people were surveyed. Forty people liked dogs, twenty-three liked cats, and ten people liked neither dogs nor cats. How many people liked both?

DO THIS
FOR
HW #4



AND
THIS



(but not the others)