Accelerated Math 1. Homework 1.

Do the following nymbers: # 5, 6, 7, 8, 9, and 14.

Exercises:

1. Give examples of several members of the following sets:

Example:

$M = \{x|\ x = mammals\}$

x can be a lion, a whale, a bat…

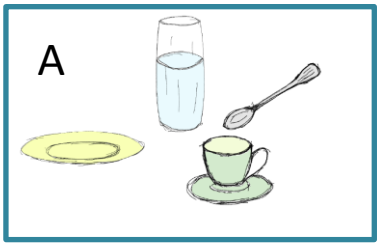
a. $K = \{y|\ y = letter\ of\ english\ alfabet\}$

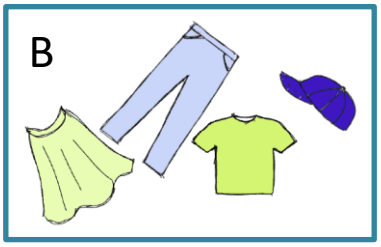
b. $M = \{x|\ x = flower\}$

c. $X = \{m|\ m = even\ number\}$

d. $P = \{k|\ k = color\}$ (2)

2. Which word we can use to describe a set, subset of which is drawn on the pictures below:





List a few other members of these sets. (2)

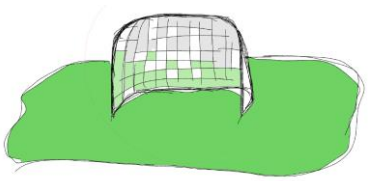
3. $A = \{2, 5, 0, 1\}$, $B = \{2, 0, 1\}$, $C = \{0, 2, 5, 1\}$, and $D = \{2, 0, 5, 4, 1\}$
Which sets are equal? (2)

4. There are 21 students in a Math class. 10 students like apples and 15 students like pears.

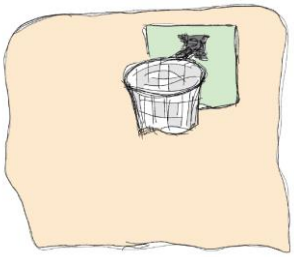
a. Show that there are some students, who like both apples and pears.

b. Is it possible to determine if there any students who do not like apples and do not like pears? Explain your answer.

c. Assume, that each student likes at least one of the fruits. (This means that each student likes either apples, or pears, or both). How many do students like both pears and apples?



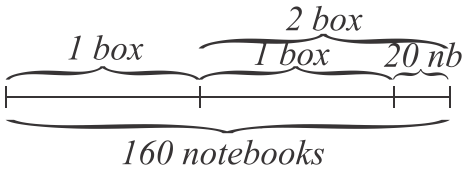
5. The same Math class (with 20 students) forms a soccer team and a basketball team. Every student signs up for at least one team: 12 students play only soccer; 2 students play both soccer and basketball; How many students play basketball only? (9)



6. Students who participated in math coopetition had to solve 2 problems, one in algebra and another in geometry. Among 100 students 65 solved algebra problem, 45 solved geometry problem, 20 students solved both problems. How many students didn't solve any problem at all? (9)

7. 240 students from New-York and Seattle attended a math camp. Of the total number of students, 125 were boys. 65 boys were from New-York. There were 53 girls from Seattle. How many students came from New-York? (6)

8. In 2 boxes there are 160 notebooks altogether. In one box there are 20 more notebooks than in the other. How many notebooks are there in each box? Solve the problem using the schematic picture on the right. (9)



9. Father is three times as old as his son. How old are they, if their combine age is 48? (draw the schematic picture similar to the picture in the previous problem). (9)

10. Viktor has 2 more sisters then brothers. How many boys and girls are there in the Victor's family, if they have 5 kids altogether? If they have 7 kids altogether? (4)

11. Place parentheses into the following expression so that the statement is true.

a. $15 - 35 + 5 \div 4 = 5$

b. $60 + 40 - 16 : 4 = 66$

c. $24 : 56 - 8 \cdot 4 = 1$

d. $96 - 12 \cdot 6 : 3 = 8$

e. $64 : 64 - 8 \cdot 4 = 2$

f. $63 : 9 + 54 = 1$

g. $75 - 15 : 5 + 10 = 22.$ (6)

12. John came to a lemonade stand with a big empty pitcher which can hold 5 liters of lemonade. He wanted to buy only 1 liter of lemonade, but a merchant had jars which can hold 3 liters and 2 liters of liquid. How merchant can measure 1 l. of lemonade if jars do not have any marks on them? Next

time when John came to the stand with exactly the same pitcher, the merchant had only 3 l and 5 l jars. Can he sell to John exactly 4 l of lemonade? (9)

13. Write the expression for the following statements:

Example:

Mary is *a* years old. Richard is 2 years older. What is the Richard's age?

Answer: $a + 2$

a. Lina is *b* years old, David is twice as old as Lina. What is the David's age?

b. John solved *x* math problems, Julia solved twice as many as John did, and Sam solved 2 problems fewer than John did. How many problems they all solved together? (4)

14. Compute:

a. $\dfrac{1-\frac{7}{12}}{10}$;

b. $\dfrac{12}{1-\frac{1}{4}}$;

c. $\dfrac{2+\frac{1}{4}}{3}$;

d. $\dfrac{5}{4-\frac{2}{3}}$

(6)

15. The cyclist rode a bicycle at a speed of 14 km / h, and the distance he traveled is 6 km. How much time did it take? Represent the answer in minutes. (4)

16. Solve the following riddles (each letter represents a digit)

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  SEND        EAT        CIRCLE        ELF
+ MORE      + THAT       CIRCLE      + ELF
 MONEY       APPLE      +CERCLE       FOOL
                         SPHERE
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(The first one is a classic, published in the July 1924 issue of Strand Magazine by Henry Dudeney.)

(10)