#9 SET THEORY

A. U = {alphabet}
A = {m, a, t, h }
B = {r, o, c, k, s}

1. $A \cup B$ = {m,a,t,h,r,o,c,k,s}
2. $A \cap B$ = $\varnothing$
3. A' = {b,c,d,e,f,g,i,j,k,l,n,o,p, q,r,s,u,v,w,x,y,z}

B. U = {integers}
M = {all odd numbers}
S = {3, 5, 7, 12, 13 }

1. True or False: $S \subset M$ F
2. M' = {all even numbers}
3. True or False: $S \in M$ F

C. U = {multiples of 11 less than 100}
T = {11, 22, 33, 44, 55}
Q = {33, 44, 55}

1. True or False: $Q \subset T$ T
2. T' = {66, 77, 88, 99}
3. True or False: $11 \in Q$ F

D. Z = {factors of 24}
X = {factors of 12}

1. True or False: $X \subset Z$ T
2. $Z \cap X$ = X {1,2,3,4,6,12}
3. $Z \cup X$ = Z {1,2,3,4,6,8,12,24}

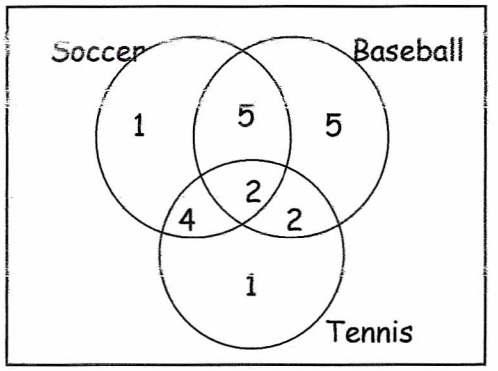
E. P = {the alphabet}
O = {consonants}

1. True or False: $P \subset O$ F
2. $P \cup O$ = P
3. $P \cap O$ = O

F. M = {e, i, g, h, t}
Name all subsets of M.

$\varnothing$ {e} {e,i} {e,i,g} {e,i,g,h} {e,i,g,h,t}
{i} {e,g} {e,i,h} {e,i,g,t}
{g} {e,h} {e,i,t} {e,i,h,t}
{h} {e,t} {e,g,h} {e,g,h,t}
{t} {i,g} {e,g,t} {i,g,h,t}
{i,h} {e,h,t}
{i,t} {i,g,h}
{g,h} {i,g,t}
{g,t} {i,h,t}
{h,t} {g,h,t}

Use the Venn diagrams to answer the questions.

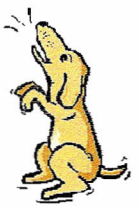


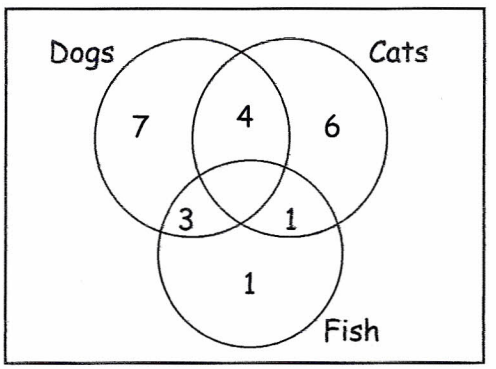
How many athletes:

1. -play soccer 12
2. - play soccer and baseball 7
3. - play baseball 14
4. - play tennis 9
5. - play soccer and tennis 6
6. - play baseball and tennis 4
7. - play tennis, baseball, & soccer 2
8. - play soccer, but not baseball or tennis? 1
9. - play soccer and baseball, but not tennis? 5
10. - play just one of the three sports? 7

26

A veterinarian surveys 26 of his patrons.
How many of them:

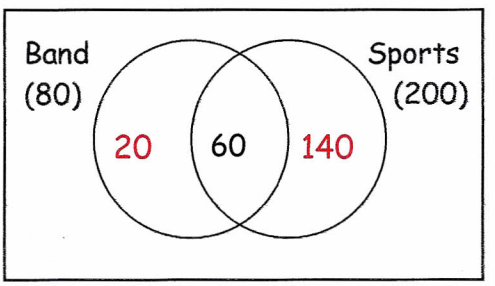




11. - have dogs 14
12. - have cats 11
13. - have fish 5
14. - have dogs and cats 4
15. - have dogs and fish 3
16. - have a cat and fish 1
17. - have none of these 3 kinds of pets 4

320

In a school of 320 students, how many



18. - are only in the band 20
19. - are only on sports teams 140
20. - participate in both activities 60
21. - are involved in either band or sports 220
22. - are not in either band or on a team 100