

Mathematical Foundations for Computer Applications

PIE Problems

Dr. Premalatha H M

Department of Computer Applications



Mathematical Foundations for Computer Applications

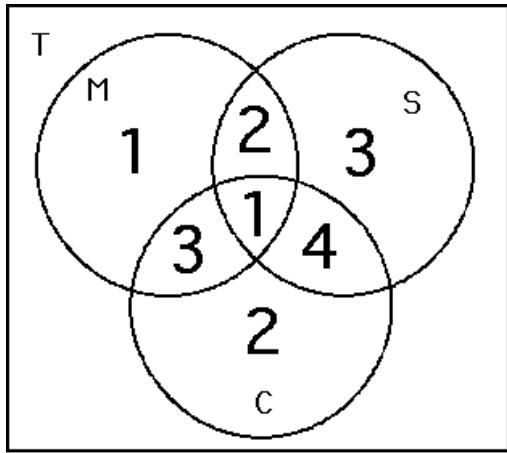
Problems

3. Among 18 students in a room, 7 study mathematics, 10 study science, and 10 study computer programming. Also, 3 study mathematics and science, 4 study mathematics and computer programming, and 5 study science and computer programming. 1 student studies all three subjects.

- (a) How many of these students study none of the three subjects?
- (b) How many of these students study only one subject?

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Solution



(a) $18 - 16 = 2$

(b) $1 + 2 + 3 = 6$

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Problems

4. There are 60 students who knows C language, 40 students knows Python , 30 students knows Java . 22 students knows C and Python, 20 students knows C and Java,15 students knows Python and Java, 8 students knows all the computer languages.
- (i)How many students know only one computer language?
- (ii) How many students know either C or Python or Java?

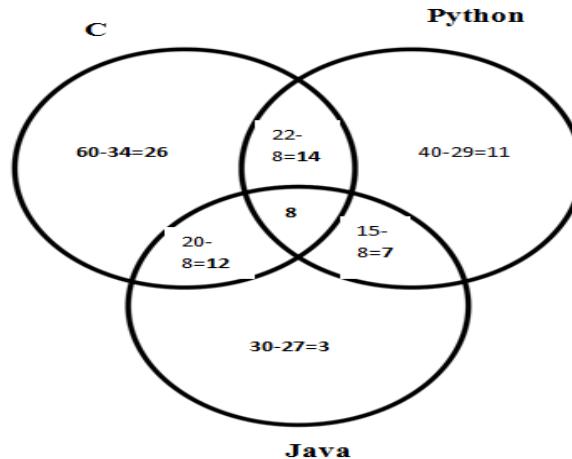
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Solution

$$|C|=60, |P|=40, |J|=30$$

$$|C \cap P|=22, |C \cap J|=20, |P \cap J|=15,$$

$$|C \cap P \cap J|=8$$



(i) $26+11+3 = 40$

(ii) $|C \cup P \cup J| = |C| + |P| + |J| - |C \cap P| - |C \cap J| - |P \cap J| + |C \cap P \cap J|$
 $= 60 + 40 + 30 - 22 - 20 - 15 + 8$
 $= 81$

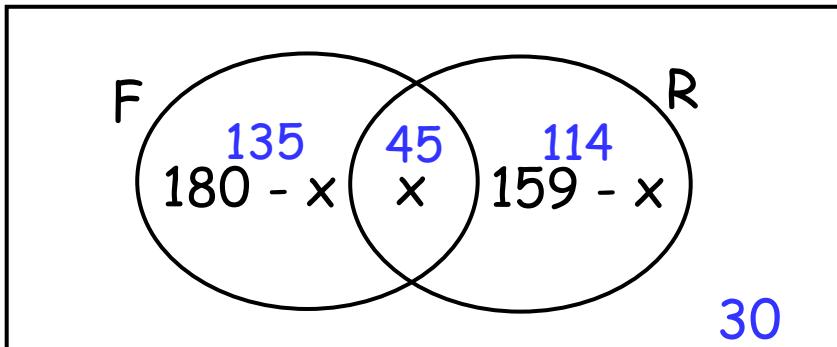
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Problems

5. In a sports survey, 324 teenagers responded to a questionnaire. They were asked if they liked football and rugby. 180 said they liked football, 159 said they liked rugby and 30 said they liked neither. Calculate how many teenagers:
- (a) liked both football and rugby.
 - (b) Liked only rugby.

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Solution



$$\begin{aligned}180 - x + x + 159 - x + 30 &= 324 \\369 - x &= 324 \\x &= 45\end{aligned}$$



THANK YOU

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Premalatha.hm@pes.edu

+91 80 26721983 Extn 224