

You may use a calculator and your homework, but not your books or notes. There are three problems worth 10 points each. **Show all of your work to receive full/partial credit.**

- 1) (#14 from 6.1) List the elements in the set of all outcomes of rolling two indistinguishable dice such that the numbers add to 8.

$$\{(4,4), (5,3), (6,2)\}$$

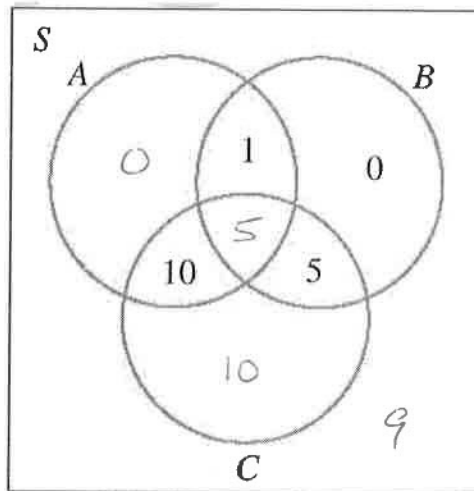
- 2) (#50 from 6.1) Let  $S$  be the set of outcomes when two distinguishable dice are rolled, let  $E$  be the subset of outcomes in which at least one die shows an even number, and let  $F$  be the subset of outcomes in which at least one die shows an odd number. List the elements in the set

$$(E \cap F)'$$

$E \cap F$  is the set of all outcomes where at least one die is even and at least one is odd. The only way this can happen is if one is even and one is odd. So,  $E \cap F$  is the set of all outcomes where one die is even and one is odd. Thus,  $(E \cap F)'$  is the set of all outcomes where both dice are even or both dice are odd

$$(E \cap F)' = \{(1,1), (1,3), (1,5), (3,1), (5,1), (3,5), (5,3), (3,3), (5,5), (2,2), (2,4), (2,6), (4,2), (6,2), (4,6), (6,4), (4,4), (6,6)\}$$

3) (#28 from 6.2) Use the given information to complete the solution of the partially solved Venn diagram.



$$n(A) = 16, n(B) = 11, n(C) = 30, n(S) = 40$$