MATH 6 HOMEWORK 25

May, 8 2022

Review, *please review the handouts of the past lessons, if needed, topics are listed on SchoolNova.org*

1. For arithmetic sequences:
    a. a10 = 131 and d = 12. What is a1?
    b. a5 = 27 and a27 = 60. Find the first term and the common difference.
    c. 11 + 12 + 13 + ... +101=
2. You throw a coin 5 times. What is the probability to get TTHTT? HHHTT?
3.
    a. How many ways are there to draw 3 cards from a 52-card deck? (Order matters: drawing first king of spades, then queen of hearts is different from drawing them in opposite order).
    b. How many ways are there to draw 3 cards from a 52-card deck if after each drawing we record the card we got, then return the card to the deck and reshuffle the deck? (As before, order matters.)
    c. We draw 3 cards from a 52-card deck, and after each drawing we record the card we got, then return the card to the deck and reshuffle the deck. What is the probability that all 3 drawn cards are different?
4. Probability to hit a duck is 1/3. Probability to miss a duck is 2/3. The hunter fires 5 shots. What is probability that he
    d. Misses all?
    e. Hits at least once?
    f. 1 hit and 4 misses?

5. You meet two inhabitants: Marge and Zoey. Marge says, 'Zoey and I are both knights or both knaves.' Zoey claims, 'Marge and I are the same.' Can you determine who is a knight and who is a knave?

6. You meet two inhabitants: Ted and Zeke. Ted claims, 'Zeke could say that I am a knave.' Zeke claims that it's not the case that Ted is a knave.

7. On the island of Knights and Knaves, you meet three inhabitants: Bozo, Carl and Joe. Bozo says that Carl is a knave. Carl tells you, 'Of Joe and I, exactly one is a knight.' Joe claims, 'Bozo and I are different.

8. *(Optional, we solved it in class, see notes)* Alice, Brian, and Charlie are from the island of knights and knaves. Alice claims, "Charlie could tell you that I am a knight." Brian says, "Either Alice is a knave, or I am a knight." Charlie says that the others are either both knaves or both knights. What are Alice, Brian, and Charlie?

9. Recall "if A then B" logic, look at the handouts from that class. Remember that if **A is False**, **A->B is a true** statement. "If the sky is green then 2+2=5" is a true statement. Write the truth table for A->B and give your own example of A->B statement.