1) If $P(A) = 0.25$, $P(B) = 0.51$, and $P(A \text{ or } B) = 0.76$, are A and B mutually exclusive?   1) ___A___

    A) Yes   B) No $P(A) + P(B) = P(A \text{ or } B)$
       If A & B are mutually exclusive, then $P(A) + P(B) = P(A \text{ or } B)$ $0.25 + 0.51 = 0.76$

2) If $P(A) = 0.37$, $P(B) = 0.7$, and $P(A \text{ or } B) = 0.74$, are A and B mutually exclusive?   2) ___A___

    A) No   B) Yes $P(A) + P(B) = P(A \text{ or } B)$
                                     0.37 + 0.7 = 0.74 ? No.

3) In a fish tank, there are 28 goldfish, 3 angelfish, and 17 guppies. If a fish is selected at   3) ___D___
   random, find the probability that it is an angelfish or a guppy.   Total: $28 + 3 + 17 = 48$

    A) $\dfrac{7}{12}$ B) $\dfrac{31}{48}$ C) $\dfrac{15}{16}$ D) $\dfrac{5}{12}$

    A: angelfish, B: guppy $P(A) + P(B) = P(A \text{ or } B)$ Therefore: $3/48 + 17/48 = 20/48 \Rightarrow 5/12$

4) If a single card is drawn from an ordinary deck of cards, what is the probability of   4) ___C___
   drawing a jack, queen, king, or ace?

    A) $\dfrac{17}{52}$ B) $\dfrac{9}{26}$ C) $\dfrac{4}{13}$ D) $\dfrac{5}{13}$

    $P(\text{jack or queen or king or ace}) = P(\text{jack}) + P(\text{queen}) + P(\text{king}) + P(\text{ace}) = 4/52 + 4/52 + 4/52 + 4/52 = 16/52 \Rightarrow 4/13$

5) A single card is drawn from a deck. Find the probability of selecting a heart or a 8.   5) ___D___

    A) $\dfrac{17}{52}$ B) $\dfrac{2}{13}$ C) $\dfrac{1}{4}$ D) $\dfrac{4}{13}$

    $P(\text{heart or 8}) = P(\text{heart}) + P(8) - P(\text{heart and 8}) = 13/52 + 4/52 - 1/52 = 16/52 \Rightarrow 4/13$ Notice that hearts and 8s are not mutually exclusive.

6) Two dice are rolled. Find the probability of getting doubles or a sum of 2.   6) ___D___

    A) $\dfrac{1}{4}$ B) $\dfrac{2}{9}$ C) $\dfrac{7}{36}$ D) $\dfrac{1}{6}$

 $P(\text{doubles or sum of 2}) = P(\text{doubles}) + P(\text{sum of 2}) - P(\text{doubles and sum of 2})$ There are 36 outcomes when rolling two dice. Doubles are (1,1), (2,2), (3,3),
                   $= 6/36 + 1/36 - 1/36 = 6/36 \Rightarrow 1/6$ (4,4), (5,5) and (6,6); a sum of two only occurs in (1,1)

7) In a recent semester at a local university, 520 students enrolled in both General   7) ___D___
   Chemistry and Calculus I. Of these students, 70 received an A in general chemistry, 81
   received an A in calculus, and 34 received an A in both general chemistry and calculus.

   Find the probability that a randomly chosen student received an A in general chemistry
   or calculus or both.

    A) 0.356   B) 0.29   C) 0.775   D) 0.225

    $P(\text{A in Chem or Calculus}) = P(\text{A in Chem}) + P(\text{A in Calculus}) - P(\text{A in both: Chem & Calculus})$
    $P(\text{A in Chem or Calculus}) = 70/520 + 81/520 - 34/520 = 117/520 \Rightarrow 0.225$

8) The frequency distribution shows the number of medical tests conducted on 30 randomly selected emergency room patients.

Number of tests performed	Number of patients
0	11
1	9
2	6
3	3
4 or more	1

Total = 30

If a patient is selected at random, find these probabilities:

a. The patient had exactly 3 tests done.　　a) P(3 tests done) = 3/30 = 1/10

b. The patient had at most 2 tests done.　　b) P(at most 2 tests done) = 11/30 + 9/30 + 6/30 = 26/30 = 13/15

c. The patient has 1 or 2 tests done.　　c) P(1 test or 2 tests) = 9/30 + 6/30 = 15/30 = 1/2

d. The patient had fewer than 3 tests done.　　d) P(fewer than 3 tests done) = 11/30 + 9/30 + 6/30 = 26/30 =13/15

e. The patient had at least 3 tests done.　　e) P(at least 3) = 3/30 + 1/30 = 4/30 = 2/15

9) An apartment building has the following distribution of apartments:　　　　9) ___A___

	1 bedroom	2 bedroom	3 bedroom	Totals
1st floor	3	0	1	4
2nd floor	1	3	2	6
3rd floor	1	4	1	6

Total 2 bedroom: 7　　　　　　　　Grand total: 16

If an apartment is selected at random, what is the probability that it is on the 2nd floor or has 2 bedrooms?

A) $\frac{5}{8}$　　　　B) $\frac{13}{16}$　　　　C) $\frac{7}{10}$　　　　D) $\frac{3}{5}$

P(Apt in 2nd floor OR it has two bedrooms)= P(2nd floor) + P(2 bedrooms) - P(Apt in 2nd floor AND it has two bedrooms)
= 6/16　　　+ 7/16　　　- 3/16　　=> 10/16 = 5/8

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