Geo 12.2 Practice Solutions

Directions 1-4: Find the following using backwards probability.

1) About 2 in 7 people "win" during the McDonalds Monopoly contest. If a person buys two meals everyday for the duration of the 60 day contest about how many "prizes" will they win?

$\frac{2}{7} = \frac{x}{120}$ $\frac{240 = 7x}{7}$ $\boxed{x = 34.3}$

2) 97% of all Unit tests are better than 70% and do not need to be retaken. If Sully gives 1500 Unit tests this year about how many of those will need to be retaken?
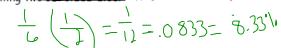
$100 - 97 = 3\%$ $\frac{3}{100} = \frac{x}{1500}$

$\frac{4500}{100} = \frac{x \cdot 100}{100}$ $\boxed{x = 45 \text{ Tests}}$

3) There's 3 out of 5 chance that when you pick a marble out of a bag it will be red. If there 45 marbles in the bag, about how many of the marbles would you expect to be red?

$\frac{3}{5} = \frac{x}{45}$ $5x = 135$ $\boxed{x = 27 \text{ red}}$

4) There's a 35% chance of rain for each day in the month of June in Germany. There are 30 days in June, about how many days should you expect it to rain for the month?

$\frac{35}{100} = \frac{x}{30}$

$1050 = 100x$ $\boxed{x = 10.5 \text{ days}}$

Directions: Find the given probability

5) What's the probability of rolling a 5 or ~~a 6 on a six-sided die~~? flipping a coin and it landing on tails?

$\frac{1}{6} + \frac{1}{2} - \frac{1}{6}\left(\frac{1}{2}\right) = \frac{7}{12} = .5833 = 58.33\%$

6) What's the probability of rolling a 5 and ~~again when rolling two six sided dice~~? flipping a coin and it landing on tails?

$\frac{1}{6}\left(\frac{1}{2}\right) = \frac{1}{12} = .0833 = 8.33\%$

7) What's the probability of picking two cards such that the first is a heart and the second is a 5 when you put your original card back in the deck?

$\frac{13}{52}\left(\frac{4}{52}\right) = \frac{1}{52} = .0192 = 1.92\%$

8) What's the probability of picking two cards such that the first is a heart and the second is a diamond without putting the original card back in the deck?

$\frac{13}{52}\left(\frac{13}{51}\right) = .0637 = 6.37\% = \frac{13}{204}$

9) What's the probability of picking a heart or a 5 from a deck?

$\frac{13}{52} + \frac{4}{52} - \frac{13}{52}\left(\frac{4}{52}\right) = \frac{17}{52} - \frac{1}{52} = \frac{16}{52}$

$\frac{4}{13} = .3077 = 30.77\%$

10) What's the probability of picking an even numbered card or a male face card? $P(\text{even}) + P(\text{mfc})$

$2, 4, 6, 8, 10, J, K$

$\frac{5}{13} + \frac{2}{13} = \frac{7}{13} = .5385$

53.85%

11) What's the probability of picking an even numbered card and a male face card when you don't put your original card back?

$\left(\frac{20}{52}\right)\left(\frac{8}{51}\right) = \frac{40}{663} = .0603$ $\boxed{6.03\%}$

12) What's the probability of picking an even numbered card and a male face card when you put your original card back?

$\left(\frac{20}{52}\right)\left(\frac{8}{52}\right) = \frac{10}{169} = .0592 = 5.92\%$

Use the following: A certain game has a person draw a card from a regular deck of cards and roll a six-sided die.

13) If a player draws a prime numbered card or rolls a prime number they win. Find P(winning). 2,3,5,7	14) If a player draws a prime numbered card and rolls a prime number they win. Find P(winning).
2,3,5 $\frac{16}{52} + \frac{3}{6} - \frac{16}{52}\left(\frac{3}{6}\right) = \frac{17}{26}$ $= .6538 = 65.38\%$	$\left(\frac{16}{52}\right)\left(\frac{3}{6}\right) = \frac{2}{13} = .1538$ 15.38%
15) Find P(red card and rolling even number)	16) Find P(non-face card or non-prime number) 1,4,6
$\frac{26}{52}\left(\frac{3}{6}\right) = \frac{1}{4} = .25 = 25\%$	roll $\frac{10}{13} + \frac{3}{6} - \frac{10}{13}\left(\frac{3}{6}\right) = .8846 = \boxed{88.46\%}$ $\frac{23}{26}$

Use the following: A certain game has a spinner with 5 equal sectors (red, maroon, blue, white, black), and rolling a 12-sided die.

17) If a player spins a red, and rolls a prime number they win. Find P(winning). 2,3,5,7,11	18) If a player spins a red, rolls a prime number they win. Find P(losing).
$\frac{1}{5}\left(\frac{5}{12}\right) = \frac{5}{60} = \frac{1}{12} = .0833 = 8.33\%$	$1 - .0833 = .9167 = \frac{11}{12}$ 91.67%
19) If a player spins a red, or rolls a prime number they win. Find P(winning).	20) If a player spins a red, or rolls a prime number they win. Find P(losing).
$\frac{1}{5} + \frac{5}{12} - \frac{1}{5}\left(\frac{5}{12}\right) = \frac{8}{15} = .5333$ 53.33%	$1 - \frac{8}{15} = \frac{7}{15} = .4667 = 46.67\%$