Lesson 10.5 Worksheet

Name: KEY

Events *A* and *B* are independent. Find the indicated probability.

1.) $P(A) = 0.4$
$P(B) = 0.6$
$P(A \text{ and } B) = ?$
$P(A \text{ and } B) = 0.4 \cdot 0.6$
$P(A \text{ and } B) = \boxed{0.24}$

2.) $P(A) = \frac{1}{4}$
$P(B) = ?$
$P(A \text{ and } B) = \frac{1}{5}$
$\frac{1}{5} = \frac{1}{4} \cdot P(B)$
$P(B) = \boxed{\frac{4}{5}}$

3.) $P(A) = ?$
$P(B) = 80\%$
$P(A \text{ and } B) = 60\%$
$60\% = P(A) \cdot 80\%$
$P(A) = \boxed{75\%}$

4.) $P(A) = 0.5$
$P(B) = ?$
$P(A \text{ and } B) = 0.1$
$0.1 = 0.5 \cdot P(B)$
$P(B) = \boxed{0.2}$

Events *A* and *B* are dependent. Find the indicated probability.

5.) $P(A) = 0.7$
$P(B|A) = 0.5$
$P(A \text{ and } B) = ?$
$P(A \text{ and } B) = 0.7 \cdot 0.5$
$P(A \text{ and } B) = \boxed{0.35}$

6.) $P(A) = \frac{4}{5}$
$P(B|A) = ?$
$P(A \text{ and } B) = \frac{8}{25}$
$\frac{8}{25} = \frac{4}{5} \cdot P(B|A)$
$P(B|A) = \boxed{\frac{2}{5}}$

7.) $P(A) = 70\%$
$P(B|A) = ?$
$P(A \text{ and } B) = 63\%$
$63\% = 70\% \cdot P(B|A)$
$P(B|A) = \boxed{90\%}$

8.) $P(A) = ?$
$P(B|A) = 0.4$
$P(A \text{ and } B) = 0.2$
$0.2 = P(A) \cdot 0.4$
$P(A) = \boxed{0.5}$

Let *n* be a randomly selected integer from 1 to 40. Find the indicated probability.

9.) *n* is prime given that it is even
$P(\text{even}) = \frac{20}{40}$ { $P(\text{prime} \mid \text{even}) = \boxed{\frac{1}{20}}$ 2

10.) *n* is 15 given that it is a multiple of three
$P(\text{mul. of 3}) = \frac{13}{40}$ { $P(15 \mid \text{mul. of 3}) = \boxed{\frac{1}{13}}$

11.) *n* is 32 given that it is greater than 25
$P(>25) = \frac{15}{40}$ { $P(32 \mid >25) = \boxed{\frac{1}{15}}$

12.) *n* is prime given that it has two digits
$P(2 \text{ dig}) = \frac{31}{40}$ { $P(\text{prime} \mid 2 \text{ dig}) = \boxed{\frac{8}{31}}$ 11, 13, 17, 19, 23, 29, 31, 37

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Find the probability of drawing the given cards from a standard deck of 52 cards (a) with replacement and (b) without replacement.

13.) A club, then a spade

a) $\frac{13}{52} \cdot \frac{13}{52} = \boxed{\frac{1}{16}}$

b) $\frac{13}{52} \cdot \frac{13}{51} = \boxed{\frac{13}{204}}$

14.) A queen, then an ace

a) $\frac{4}{52} \cdot \frac{4}{52} = \boxed{\frac{1}{169}}$

b) $\frac{4}{52} \cdot \frac{4}{51} = \boxed{\frac{4}{663}}$

15.) A face card, then a 6

a) $\frac{12}{52} \cdot \frac{4}{52} = \boxed{\frac{3}{169}}$

b) $\frac{12}{52} \cdot \frac{4}{51} = \boxed{\frac{4}{221}}$

16.) A 10, then a 2

a) $\frac{4}{52} \cdot \frac{4}{52} = \boxed{\frac{1}{169}}$

b) $\frac{4}{52} \cdot \frac{4}{51} = \boxed{\frac{4}{663}}$

17.) A king, then a queen, then a jack

a) $\frac{4}{52} \cdot \frac{4}{52} \cdot \frac{4}{52} = \boxed{\frac{1}{2197}}$

b) $\frac{4}{52} \cdot \frac{4}{51} \cdot \frac{4}{50} = \boxed{\frac{8}{16575}}$

18.) A spade, then a club, then another spade

a) $\frac{13}{52} \cdot \frac{13}{52} \cdot \frac{13}{52} = \boxed{\frac{1}{64}}$

b) $\frac{13}{52} \cdot \frac{13}{51} \cdot \frac{12}{50} = \boxed{\frac{13}{850}}$

19.) Each drawer in a 5-drawer file cabinet has 50 folders. You are searching for some information that is in one of the folders, but you do not know which folder has the information.

a.) What is the probability that the information is in the first drawer you choose?

$P(1^{st}\text{ drawer}) = \boxed{\frac{1}{5}} = \boxed{0.2}$

b.) What is the probability that the information is **not** in the first folder you choose?

$P(\overline{1^{st}\text{ folder}}) = 1 - P(1^{st}\text{ folder})$

$= 1 - \left(\frac{1}{5} \cdot \frac{1}{50}\right) = 1 - \frac{1}{250} = \boxed{\frac{249}{250}} \approx \boxed{0.996}$

c.) What is the probability that the information is **not** in the first six folders you choose?

$P(\overline{1^{st}}) \cdot P(\overline{2^{nd}}) \cdot P(\overline{3^{rd}}) \cdot P(\overline{4^{th}}) \cdot P(\overline{5^{th}}) \cdot P(\overline{6^{th}})$

$= \frac{249}{250} \cdot \frac{248}{249} \cdot \frac{247}{248} \cdot \frac{246}{247} \cdot \frac{245}{246} \cdot \frac{244}{245}$ OR $\frac{249 P_6}{250 P_6} \approx \boxed{0.976}$

20.) Angela usually rushes to make it to the bus stop in time to catch the school bus, and will often miss the bus if it it early. The bus comes early to Angela's stop 28% of the time. What is the probability that the bus will come early *at least once* during a 5 day school week?

$P(\text{on time}) = 0.72$

$P(\text{on time everyday}) = \underset{M}{0.76} \cdot \underset{TU}{0.76} \cdot \underset{W}{0.76} \cdot \underset{TH}{0.76} \cdot \underset{F}{0.76} = 0.1935$

$P(\text{early at least once}) = 1 - 0.1935$

$= \boxed{0.8065 = 81\%}$

21.) The probability of selecting a rotten apple from a basket is 14%. What is the probability of selecting 3 good apples when selecting 1 apple from each of 3 different baskets?

$P(\text{Good apple}) = 0.86$

$P(3\text{ Good apples}) = \underset{B_1}{0.86} \cdot \underset{B_2}{0.86} \cdot \underset{B_3}{0.86}$

$= \boxed{0.636}$

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