PROBABILITY WORKSHEET

There are several probability formulas that are necessary in statistics. In each of the following formulas, A, B, and E represent events.

Complementation Rule	$p\,(not\,E) = 1 - p\,(E)$
General Addition Rule	$p\,(A\,or\,B) = p\,(A) + p\,(B) - p\,(A\,\&\,B)$
Conditional Probability Rule	$p\,(B\|A) = \frac{p(A\,\&\,B)}{p(A)}$
Multiplication Rule	$p\,(A\,\&\,B) = p\,(B\|A) \cdot p\,(A)$

Use these formulas in the following problems to calculate the desired probabilities.

1. Given $p\,(A) = .37$, find $p\,(not\,A)$.

2. Given $p\,(not\,B) = .71$, find $p\,(B)$.

3. Given $p\,(A) = .63$, $p\,(B) = .51$, and $p\,(A\,\&\,B) = .32$, find $p\,(A\,or\,B)$.

4. Given $p\,(A) = .47$, $p\,(B) = .38$, and $p\,(A\,or\,B) = .63$, find $p\,(A\,\&\,B)$.

5. Given $p\,(A) = .75$, $p\,(A\,or\,B) = .93$, and $p\,(A\,\&\,B) = .46$, find $p\,(B)$.

6. Given $p\,(A) = .42$ and $p\,(A\,\&\,B) = .21$, find $p\,(B|A)$.

7. Given $p\,(A) = .3$ and $p\,(B|A) = .17$, find $p\,(A\,\&\,B)$.

8. Given $p(B|A) = .5$ and $p(A \,\&\, B) = .35$, find $p(A)$.

9. Given $p(A) = .2$, $p(B) = .25$, and $p(B|A) = .5$, find
a. $p(A \,\&\, B)$

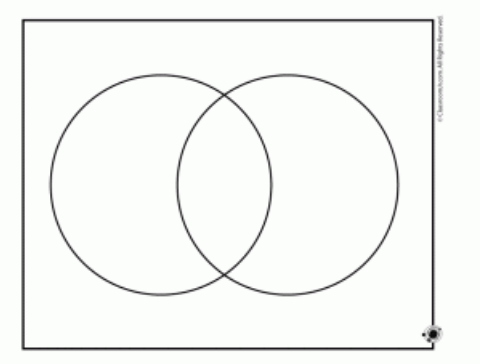
b. $p(A \,or\, B)$

10. Given $p(A) = .4$, $p(B) = .5$, and $p(A \,or\, B) = .8$, find
a. $p(A \,\&\, B)$

b. $p(B|A)$

c. $p(A|B)$

d. Label all four regions of the following Venn Diagram with the correct probabilities.



Answers:

1	.63	5	.64	9a	.1	10c	.2
2	.29	6	.5	9b	.35	10d	$p\left(A \,\&\, \overline{B}\right) = .3$
3	.82	7	.051	10a	.1		$p\left(\overline{A} \,\&\, B\right) = .4$
4	.22	8	.7	10b	.25		$p\left(\overline{A} \,\&\, \overline{B}\right) = .2$