Warm up DATE: _____

1. The probability of me eating a tuna sandwich is 20%, and the probability that I will have dessert is 10%. The probability that I will eat a tuna sandwich and have dessert is 7.5%. Are the events "Eating a tuna sandwich" and "Having dessert" dependent or independent? Justify you answer by demonstrating a probability test.

If A and B are independent, then $P(A \cap B) = P(A)P(B)$.
So, test it.

$P(A \cap B) = P(A)P(B)$
$0.075 \stackrel{?}{=} 0.20 \cdot 0.10$
$0.075 \neq 0.02$

∴ Dependent

2. A jar contains 3 blue marbles, 5 yellow marbles, and 12 black marbles. If I choose a marble, then another marble without putting the first on back in the goblet, what is the probability that the first marble will be yellow, and the second will be black?

These are dependent events... you are NOT replacing.

Total
3+5+12
= 20

$P(A \cap B) = \frac{5}{20} \cdot \frac{12}{19} = \frac{60}{380} = \boxed{\frac{3}{19}}$ or $\boxed{\approx 0.158}$ or $\boxed{\approx 15.8\%}$

3. The table below shows the results of a poll of 200 individuals who support a particular law being introduced.

	Yes	No	Total
Men	40	60	100
Women	90	10	100
Totals	130	70	200

a) What is the probability a randomly selected individual is a male (A) and did not support the law (B)?

$P(A \cap B) = \frac{60}{200} = \boxed{\frac{3}{10}}$

b) What is the probability that a randomly selected individual did not support the law (B) given they were a man (A)?

$P(B|A) = \frac{60}{100} = \boxed{\frac{3}{5}}$ or $\boxed{0.60}$ or $\boxed{60\%}$

c) What is the probability that a randomly selected individual supported the law given they were female?

$P(\text{supported (Yes)} \mid \text{female}) = \frac{90}{100} = \boxed{\frac{9}{10}}$ or $\boxed{0.9}$ or $\boxed{90\%}$