

7. What is the probability that you guess correctly on all of the questions if there are 6 true/false questions and 4 multiple choice questions with 5 choices each?

$$\frac{1}{2^6 \cdot 5^4} = \boxed{2.5 \times 10^{-5} = 0.000025}$$

8. A sub sandwich shop offers 4 different breads, 6 different meats, and 8 different veggies. If you want to order a \$3 sub sandwich, you can pick one bread, one meat, and one veggie. How many different \$3 sub sandwiches can you make?

$$4 \cdot 6 \cdot 8 = \boxed{192}$$

6.6 (9) A pair of fair 4-sided dice is tossed. Let $A = \{\text{the sum is 4}\}$ and $B = \{3 \text{ appears on either die}\}$. $\{(1,3)(2,2)(3,1)\}$ and $\{(3,1)(3,2)(3,3)(3,4), (1,3)(2,3)(4,3)\}$
 a. Find $P(B|A)$. b. Find $P(A|B)$.

$$\frac{P(B \cap A)}{P(A)} = \frac{\frac{2}{16} \cdot \frac{16}{3}}{\frac{3}{16}} = \boxed{\frac{2}{3}}$$

$$\frac{P(A \cap B)}{P(B)} = \frac{\frac{2}{16} \cdot \frac{16}{7}}{\frac{7}{16}} = \boxed{\frac{2}{7}}$$

10. Mrs. Ketterhagen's FST classes first semester of the 2014-15 school year.

	Boys	Girls	
Period 4	15	7	22
Period 5	14	9	23
Period 6	12	2	14
	41	18	59

a. What percent of all students are boys?

$$\frac{41}{59} = \boxed{69.5\%}$$

b. What percent of period 6 students are girls?

$$\frac{2}{14} = \boxed{14.3\%}$$

6.6 (11) Suppose all patients are tested for a serious disease that is estimated to be found in 0.5% of people. Suppose also that the test accurately spots the disease 98% of the time and accurately indicates no disease 95% of the time.

a. Make a contingency table for this situation:

	Disease 0.5%	No Disease 99.5%
Test +	98%	5%
Test -	2%	95%
Total	100%	100%

b. What is the probability that someone who tests negative does in fact have the disease?

$$\frac{P(D \cap \text{neg})}{P(\text{neg})} = \frac{(0.005)(0.02)}{(0.005)(0.02) + (0.995)(0.95)} = \frac{0.0001}{0.94525} = 1.06 \times 10^{-4}$$