

## 9-7 Probability of Multiple Events

$$P(A \text{ and } B) = P(A) \cdot P(B)$$

Dependant Events: First event affects the outcome of a second event.

Independent Events: First event does *not* affect the outcome of a second event.

Mutually Exclusive Events: Two events *cannot* happen at the same time.

$$P(A \text{ or } B) = P(A) + P(B)$$

Not Mutually Exclusive Events: Two events *can* happen at the same time.

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A) = \frac{2}{5}, P(B) = 80\%, P(C) = 0.20$$

1) P(A and C)

2) P(A or C) if Mutually Exclusive

3) P(A or B) if *not* Mutually Exclusive

3 Large Blue Marbles, 2 Large Green Marbles, 2 Small Blue, and 5 Small Green Marbles

4) P(Large or Green)

5) With Replacement: P(a Blue then a Small)

6) Without Replacement: P(Two Blue)

7) Without Replacement: P(a Large then a Small)

## 12-2 Conditional Probability

$P(B | A)$  = Probability of event B, given event A

	Male	Female
Freshmen		
Sophomore		
Juniors		
Seniors		

1) P(Male)

2) P(Junior | Female)

3) P(Male | Sophomore)

4) P(Sophomore | Freshman)

Survey: 20% of the people were left-handed, 30% of the left-handed people are males, and 60% of the right-handed people are females.

5) P(male | right-handed)

6) P(left-handed female)

**12-4 Standard Deviation:** How much values in a data set vary (deviate) from the mean.

$$\text{Standard Deviation} = \sigma = \sqrt{\frac{(1^{\text{st}} \# - \text{Mean})^2 + (2^{\text{nd}} \# - \text{Mean})^2 + \dots + (\text{Last} \# - \text{Mean})^2}{n}}, n = \# \text{ of terms}$$

$$\text{Variance} = \sigma^2$$

1. Standard Deviation: 7, 12, 1, 4

2. Which of the following set of data will probably have the *largest* standard deviation and which will have the *smallest*?

3. Variance: 10, 2, 7, 3, 13

- a) 13, 20, 10, 5, 27, 12
- b) 26, 21, 24, 23, 25, 17
- c) 10, 15, 30, 41, 2, 1
- d) 18, 90, 87, 31

**Exponent Properties**

$a^m \cdot a^n =$	$x^3 \cdot x^2 =$	$(-5x^3y)(6x^2y^7) =$	
$(a^m)^n =$	$(x^2)^3 =$	$3x^7(x^5)^2 =$	
$\frac{a^m}{a^n} =$	$\frac{x^5}{x^3} =$	$\frac{6x^6y^8}{9x^3y^7} =$	
$a^{-n} =$	$\frac{x^2}{x^5} =$	$3^{-2} =$	$5x^{-4}y =$
$(ab)^n =$	$(-2x)^3 =$	$(x^5y^{-3})^{-4} =$	
$\left(\frac{a}{b}\right)^n =$	$\left(\frac{x}{5}\right)^2 =$	$\left(\frac{x^3}{y}\right)^{-5} =$	
$a^0 =$	$\frac{x^2}{x^2} =$	$3x^0 =$	$(-5x)^0 =$

**Radical Expressions and Rational Exponents**

$$x^{a/b} = \sqrt[b]{x^a} = \left(\sqrt[b]{x}\right)^a \quad \text{Radical Notation:}$$

$$\text{Rational Exponent Notation:}$$

1. Simplify and rewrite in radical notation:  $x^{4/6}$

2. Simplify and rewrite in rational exponent notation:  $\sqrt[4]{x^{10}}$

3. Simplify:  $36^{-3/2}$

**7-5 Solving Square Roots**

1) Solve:  $\sqrt{2x-3} + 7 = 11$