# Understanding the Greeks

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# The Greeks

- Delta: The amount a theoretical option's price will change for a corresponding one-unit (point) change in the price of the underlying security.
- Gamma: The amount a theoretical option's delta will change for a corresponding one-unit (point) change in the price of the underlying security.
- Theta: The amount a theoretical option's price will change for a corresponding one-unit (day) change in the days to expiration of the option contract.
- Vega: The amount a theoretical option's price will change for a corresponding one-unit (percent) change in implied volatility.

# Delta – Example I

- **Delta:** The amount a theoretical option's price will change for a corresponding one-unit (point) change in the price of the underlying security.

**Stock @ 50 → 51 → 52**
**Strike is 50**
**3 Month Call**
**$3 → 3.50 → 4.10**

**Non-Textbook Definition**

The delta is the probability of the option being in the money on expiration.

# Delta – Example II

- **Delta: Non-Textbook Definition**

  The delta is the probability of the option being in the money on expiration.

**Stock @ 50 ⟶ 51**
**Call Strike is 50**

**1) One Day to Expiration**

**Δ ⟶ .50 ⟶ .90**

**2) Sixty Days to Expiration**

**Δ ⟶ .50 ⟶ .60**

# Gamma

- **Gamma:** The amount a theoretical option's delta will change for a corresponding one-unit (point) change in the price of the underlying security.

- Gamma is highest for the near-term ATM strike, and slopes off toward the ITM and OTM strikes.

# Delta – Example II

- **Delta: Non-Textbook Definition**

  The delta is the probability of the option being in the money on expiration.

**Stock @ 50 ⟶ 51**
**Call Strike is 50**

**1) One Day to Expiration**

**Δ ⟶ .50 ⟶ .90**

**2) Sixty Days to Expiration**

**Δ ⟶ .50 ⟶ .60**

# Theta

- **Theta:** The amount a theoretical option's price will change for a corresponding one-unit (day) change in the days to expiration of the option contract.

# Theta

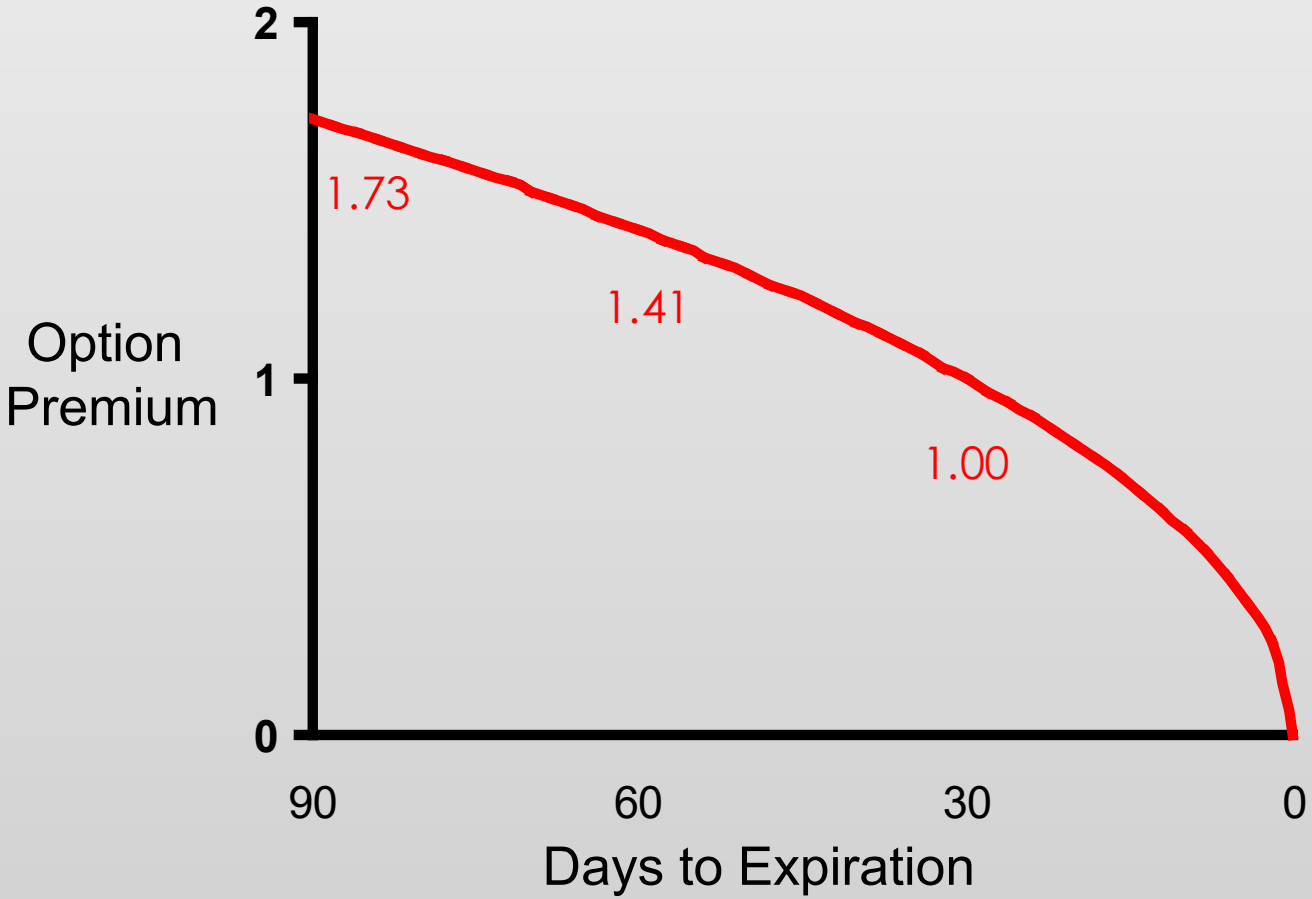
## Time Decay of an At-The-Money-Call

1 month = $1

2 month = $1 x $\sqrt{2}$ = 1.41

3 month = $1 x $\sqrt{3}$ = 1.73

# Time Decay of ATM Call Option



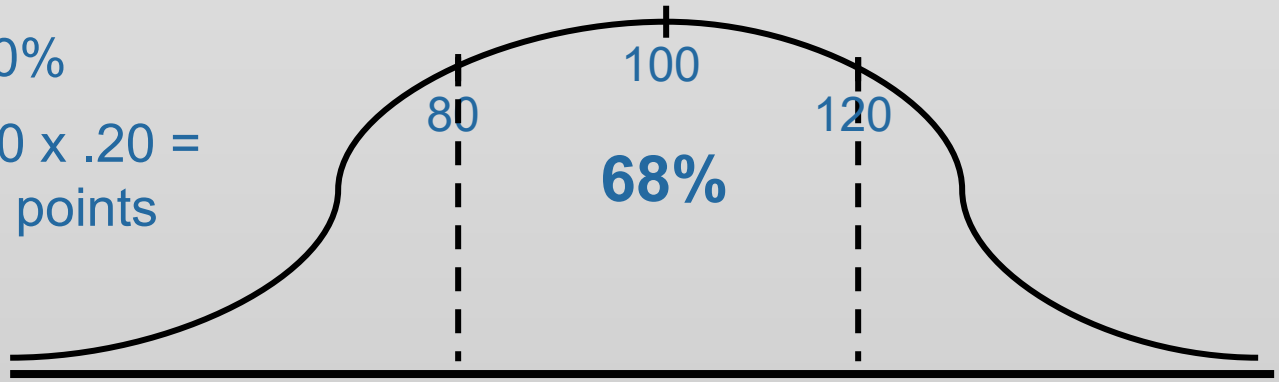
# Vega - Volatility

- Historical
  - the annualized standard deviation of the past stock price movement
- Implied
  - volatility that justifies an option's current market price and is also stated as an annual number can only be found using an option pricing calculator

Stock @ 100

Imp. Vol. = 20%

St. Dev. = 100 x .20 = 20 points



# Takeaways

- No matter the strategy think of how Gamma, Theta and Vega will effect Delta.
- Try to control the Greeks (when you can) within your strategies based potential dates of news events (ie. earnings), the expiration you choose and the history of underlying security you are trading.
  - In general, think about what you want to happen to your option prices
  - Good examples
    - Calendars
    - Butterflies

# THE OPTIONS GUY

## Brian Overby

Discuss options trading with me via:

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To learn more about option strategies:
OptionsPlaybook.com