

### Options basics

An option is a contract between two investors:

- Issuer (or seller), holder of a short position. He sells the option.
- Holder (buyer), holder of a long position. He buys the option.

Types of options:

- Call option: Gives the holder the right to buy an asset by a certain date for a certain price with a fee. This fee it is the price of the option or premium.
- Put option: Gives the holder the right to sell an asset by a certain date for a certain price with a fee. This fee it is the price of the put or premium.
- The date specified it is called: the expiration date or maturity date. The price specified it is called the exercise price or the strike price.
- There are European options (can be exercised only on the expiration date) and American options (can be exercised at any time up to the expiration date).

Stock options mechanics:

1. Options are normally traded in units of 100 shares. The price of the option is on a per share basis. Therefore, if the price of an option is priced at \$0.50, the total premium for that option would be \$50 ( $0.50 \times 100 = \$50$ .)
2. Stock options are on a January, February, or March cycle. Stocks are randomly assigned in one of these three cycles. For example, IBM is on a January cycle.
3. Stock options expired on the Saturday immediately following the third Friday of the expiration month.

**CALL OPTION: IT IS EXERCISED ONLY WHEN  $S_1 > E$**

**PRICE OF THE STOCK AT EXPIRATION DATE**

$$S_1 \leq E$$

$$S_1 > E$$

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**WRITER (SELLER)**



**HOLDER (BUYER)**



**PUT OPTION: IT IS EXERCISED ONLY WHEN  $S_1 < E$**

**PRICE OF THE STOCK AT EXPIRATION DATE**

$$S_1 < E$$

$$S_1 \geq E$$



**WRITER (SELLER)**



**HOLDER (BUYER)**

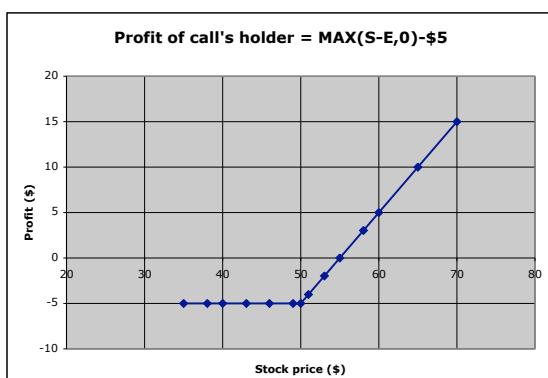
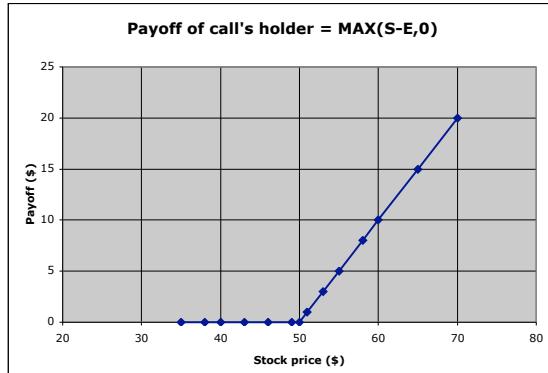


### Options - Examples

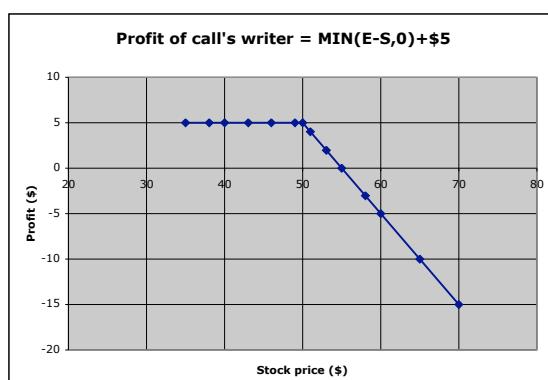
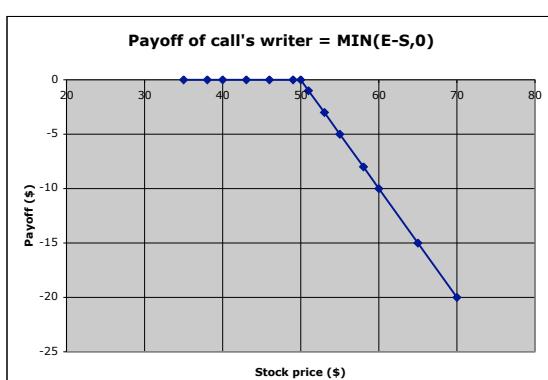
Holder of a call option ( $E = \$40$ )	Payoff at expiration if $S_1 = \$38$
Writer of a call option ( $E = \$45$ )	Payoff at expiration if $S_1 = \$50$
Holder of a call option ( $E = \$60$ )	Payoff at expiration if $S_1 = \$63$
Writer of a call option ( $E = \$50$ )	Payoff at expiration if $S_1 = \$48$
Holder of a put option ( $E = \$40$ )	Payoff at expiration if $S_1 = \$38$
Writer of a put option ( $E = \$45$ )	Payoff at expiration if $S_1 = \$50$
Holder of a put option ( $E = \$60$ )	Payoff at expiration if $S_1 = \$63$
Writer of a put option ( $E = \$50$ )	Payoff at expiration if $S_1 = \$48$

EXERCISE PRICE: \$50  
PRICE OF CALL: \$5

S	PAYOUT $\text{MAX}(S-E,0)$	PROFIT
35	0	-5
38	0	-5
40	0	-5
43	0	-5
46	0	-5
49	0	-5
50	0	-5
51	1	-4
53	3	-2
55	5	0
58	8	3
60	10	5
65	15	10
70	20	15

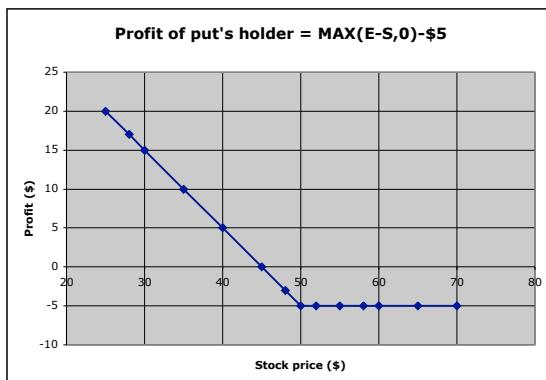
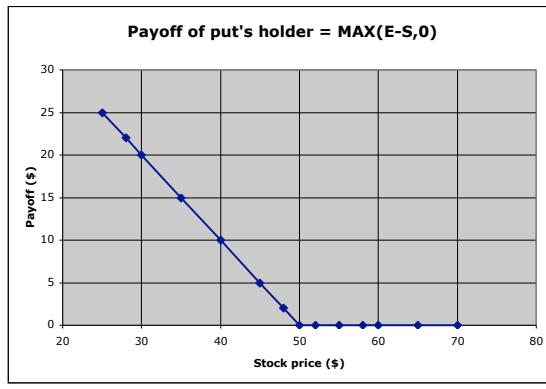


S	PAYOUT $\text{MIN}(E-S,0)$	PROFIT
35	0	5
38	0	5
40	0	5
43	0	5
46	0	5
49	0	5
50	0	5
51	-1	4
53	-3	2
55	-5	0
58	-8	-3
60	-10	-5
65	-15	-10
70	-20	-15



EXERCISE PRICE: \$50  
PRICE OF PUT: \$5

S	PAYOUT $\text{MAX}(E-S, 0)$	PROFIT
25	25	20
28	22	17
30	20	15
35	15	10
40	10	5
45	5	0
48	2	-3
50	0	-5
52	0	-5
55	0	-5
58	0	-5
60	0	-5
65	0	-5
70	0	-5



S	PAYOUT $\text{MIN}(S-E, 0)$	PROFIT
25	-25	-20
28	-22	-17
30	-20	-15
35	-15	-10
40	-10	-5
45	-5	0
48	-2	3
50	0	5
52	0	5
55	0	5
58	0	5
60	0	5
65	0	5
70	0	5

