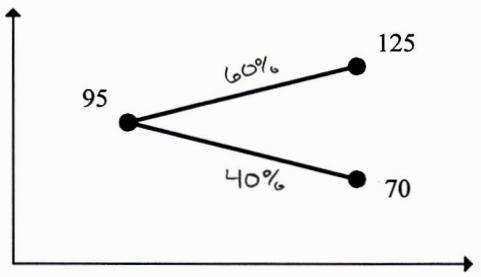
HW 10.1 (a) Key

1. Prices for a nondividend-paying stock are modeled by the 1-period binomial tree shown below, with the period being 9 months and the probability of an up move being $p = 60\%$. Find α, the continuously compounded expected annual yield on the stock. [20a_01]



$t = 9/12 = 3/4$

$E[S_t] = 0.6(125) + 0.4(70)$

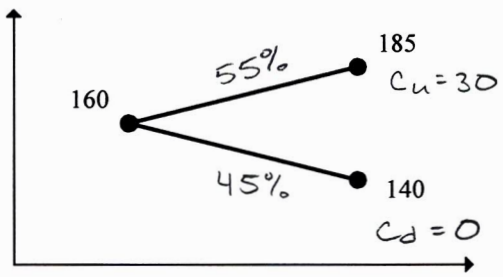
$= 103$

$95e^{0.75\alpha} = 103$

$\alpha = \boxed{10.78\%}$

[A] 10.78% B) 11.00% C) 11.21% D) 11.43% E) 11.645

2. Prices for a nondividend-paying stock are modeled by the 1-period binomial tree shown below, with the period being 6 months and the probability of an up move being $p = 55\%$. Find the expected payoff of a 155-strike, 6-month European call with a premium of 15.64. [20a_02]



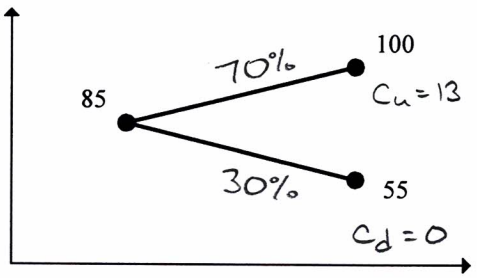
$t = 1/2 \qquad K = 155$

$E[P_0] = 0.55(30)$

$= \boxed{16.5}$

[A] 16.50 B) 16.17 C) 16.83 D) 17.16 E) 17.49

3. Prices for a nondividend-paying stock are modeled by the 1-period binomial tree shown below, with the period being 4 months and the probability of an up move being $p = 70\%$. Find the continuously compounded expected annual yield of a 87-strike, 4-month European call with a premium of 8.82. [20a_03]



$t = 1/3 \qquad K = 87$

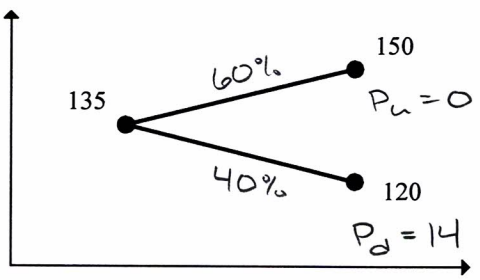
$E[P_0] = 0.7(13) = 9.1$

$8.82\, e^{r/3} = 9.1$

$r = \boxed{9.38\%}$

[A] 9.38% B) 8.81% C) 9.00% D) 9.19% E) 9.56%

4. Prices for a nondividend-paying stock are modeled by the 1-period binomial tree shown below, with the period being 8 months and the probability of an up move being $p = 60\%$. Find the expected payoff of a 134-strike, 8-month European put with a premium of 5.39. [20a_04]



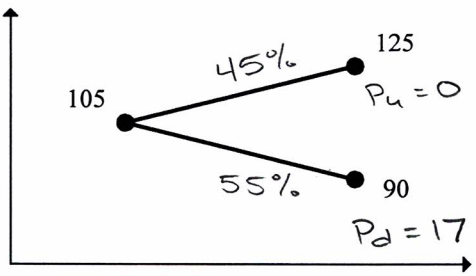
$t = 2/3 \qquad K = 134$

$E[P_0] = 0.4(14) = 5.6$

$5.39\, e^{\alpha \cdot 2/3} = \boxed{5.6}$

[A] 5.60 B) 5.38 C) 5.49 D) 5.71 E) 5.82

5. Prices for a nondividend-paying stock are modeled by the 1-period binomial tree shown below, with the period being 9 months and the probability of an up move being $p = 45\%$. Find the continuously compounded expected annual yield of a 107-strike, 9-month European put with a premium of 8.36. [20a_05]



$t = 3/4 \qquad K = 107$

$E[P0] = 0.55(17) = 9.35$

$8.36\, e^{0.75\gamma} = 9.35$

$\gamma = 14.92\%$

A) 14.92% B) 14.62% C) 15.22% D) 15.52% E) 15.82%