

1. The one-year returns of a portfolio are 2.22%, -7.77% , and 3.33%. What is the geometric average return of the portfolio?
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2. The arithmetic monthly average log return of a portfolio over 20 months is 1.717%.

(a) What is the value of the average monthly geometric return?

(b) What is the value of the average annualized geometric return?

3. At year t , the two-year geometric average return of a portfolio is 5.55%, and the three-year geometric average return is -8.88%. What is the one-year geometric average return for year $t - 2$?
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4. You are a long-term investor and you invest \$1,000 in 2000 and after 10 years, your investment value is \$4,000. What is the average geometric return?
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5. The following shows the index levels of S&P 500 index and its total return index.

End of Year	S&P Index	S&P Total Return Index
2017	2673.61	5212.763
2018	2506.85	4984.217

(a) What is the (implied) dividend yield for 2018?

(b) What is the (implied) amount of dividend in index points?

6. The backward adjustment formula of [yahoo!finance](#) can be written as a function of dividend yield at time t and the simple return. Give a proof of this proposition.
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7. What are your takeaways (something interesting, refreshing, or exciting)? Any questions?