1. Write down the multipliers that correspond to these percentage changes:
   1. 10% increase;
   2. 10% decrease.
2. Use your answers to part (1) above to explain why:
   1. a 10% increase followed by another 10% increase gives an overall increase of 21%;
   2. a 10% decrease followed by another 10% decrease gives an overall decrease of 19%.
3. Think about the following questions very carefully:
   1. Does a 10 % increase followed by a 10% decrease have the same overall effect as a 10% decrease followed by a 10% increase?
   2. Are the consecutive changes described in part (a) equivalent to no overall change? Explain how you have made your decision.

**Solution**

1. :
   1. 10% increase produces 110% having multiplier 1.10;
   2. 10% decrease produces 90% having multiplier 0.90.
2. :
   1. Successive increases of 10% yield the multiplier 1.102 = 1.21 which represents 121% and so corresponds to an overall increase of 21%.
   2. Successive decreases of 10% yield the multiplier 0.902 = 0.81 which represents 81% and so corresponds to an overall decrease of 19%.
3. :
   1. A 10% increase then a 10% decrease has multiplier 1.10 × 0.90 = 0.99 and a 10% decrease then a 10% increase has multiplier 0.90 × 1.10 = 0.99. Since these have the same overall multipliers their overall effects are the same.
   2. From the result of part (b) the overall multiplier is 0.99 which corresponds to 99% and so the overall effect is not ‘zero change’ but is a 1% decrease.