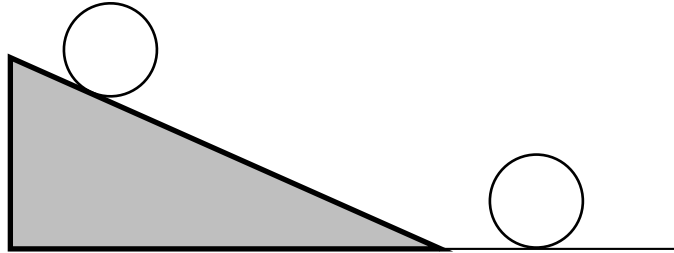


Consider the race of rolling down the inclined plane for the following 4 objects

- 1: Ring: mass =  $m$ , radius =  $r$
- 2: Disk: mass =  $m$ , radius =  $r$
- 3: Disk: mass =  $\frac{m}{2}$ , radius =  $2r$
- 4: Disk: mass =  $2m$ , radius =  $\frac{r}{2}$



Choose the correct set.

- A) fastest: 2 only and slowest: 1.  
B) fastest: 2 only and slowest: 4.  
C) fastest: 2 only and slowest: 3, 4.  
D) fastest: 2, 3, 4 and slowest: 1.

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Let :  $k = \frac{I}{m r^2}$ .

$$k_1 = \frac{m r^2}{m r^2} = 1, k_2 = \frac{m r^2}{2 m r^2} = k_3 = k_4 = 0.5.$$

The smaller is  $k$ , the greater is the speed.  
So 2, 3 and 4 are faster, and 1 is the slowest.  
Answer **D**.