Answer on Question #36180-Physics-Mechanics-Relativity

3 grooves AB, AC and AD are made in a circular disk lying in a vertical plane 3 particles B,C and D constrained to move along path AB,AC and AD respectively are released from point A. Particle B reaches point B in time tB, particle C reaches point C in time tC and particle D reaches at point D in time tD. Then which of the following statements is incorrect

tB=tC=tD

tB>tC=tD

tC>tB>tD

tD=tB>tC

Answer: all incorrect except tB=tC=tD.

The time taken would be same.

$$s = \frac{at^2}{2}$$

$$a = g\cos\theta$$

$$s = d\cos\theta$$

$$t = \sqrt{\frac{2s}{a}} = \sqrt{\frac{2d\cos\theta}{g\cos\theta}} = \sqrt{\frac{2d}{g}} = const.$$

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