Astro 1: Introductory Astronomy

http://apod.nasa.gov/apod/ap050830.html

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The Earth moves in its (nearly) circular orbit

it goes around the Sun once in a year $(3.15 \times 10^7 \text{ s})$

1 Astronomical Unit (A.U.) = $(1.50 \times 10^{11} \text{ m})$
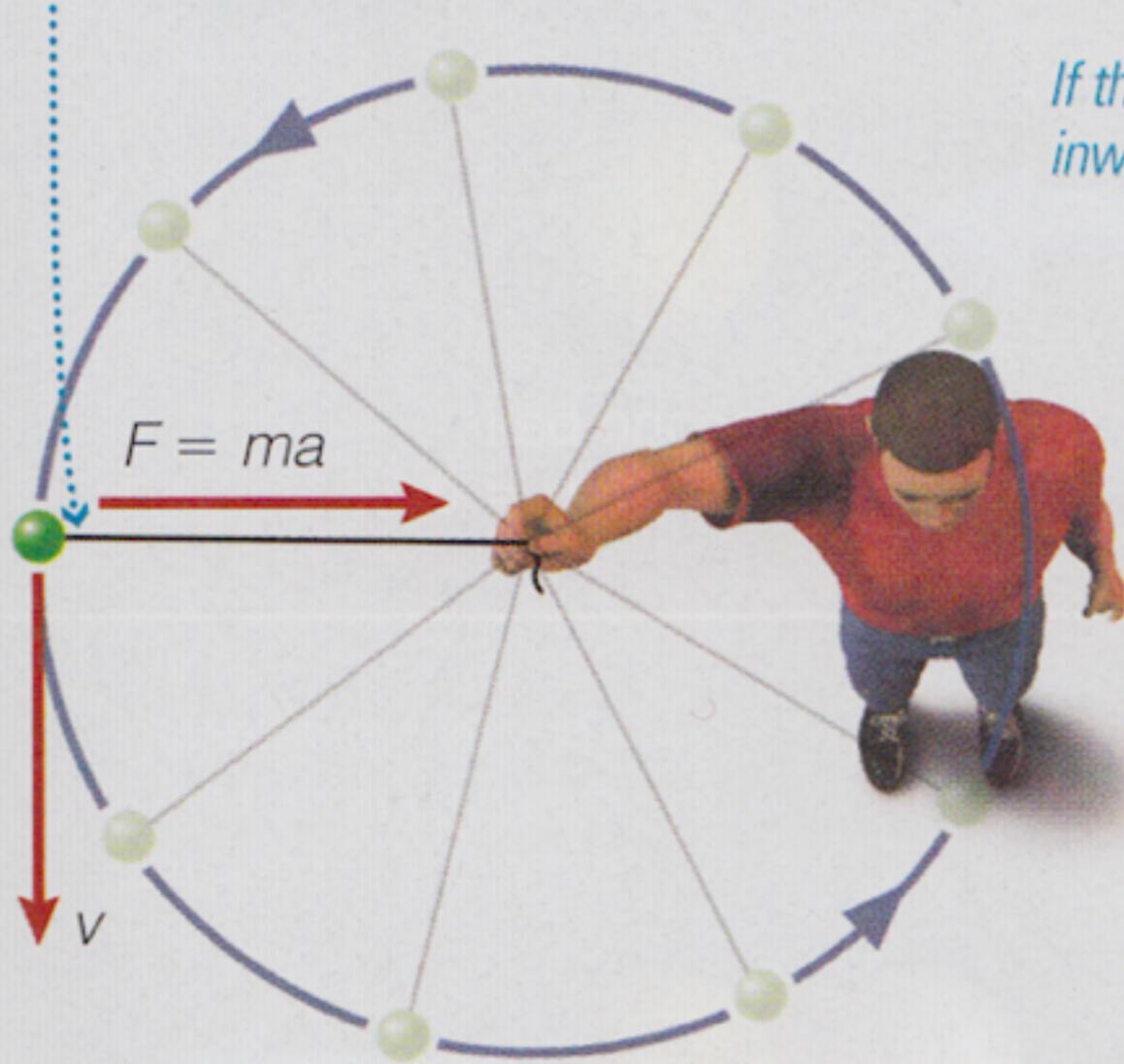
How fast does the Earth move?
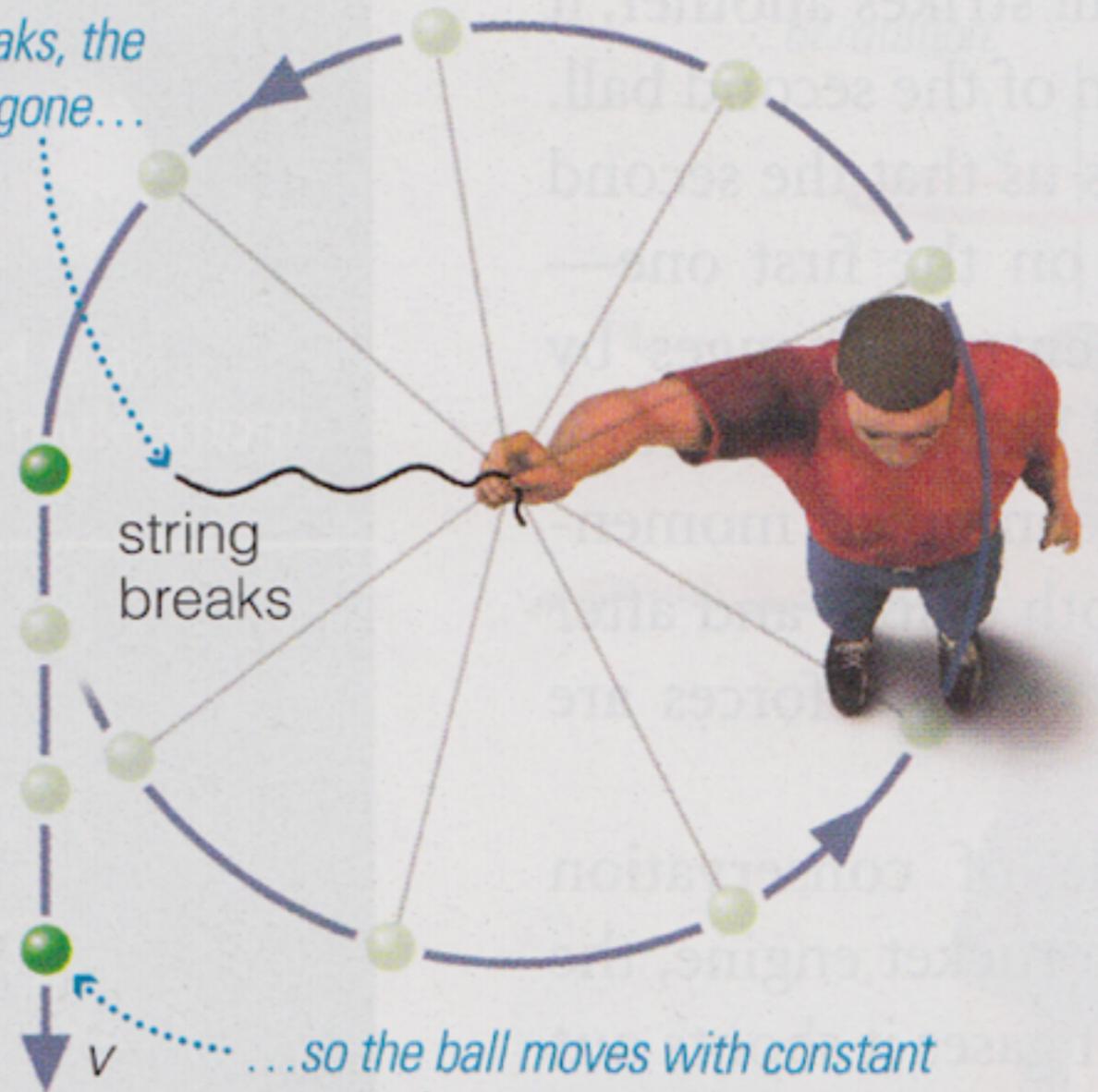
you do *not* need any of the physics from Ch. 4

How long does it take the Earth to move a distance equal to its own diameter?

FIGURE 4.6

The inward force along the string keeps the ball moving in a circle.

$F = ma$

v

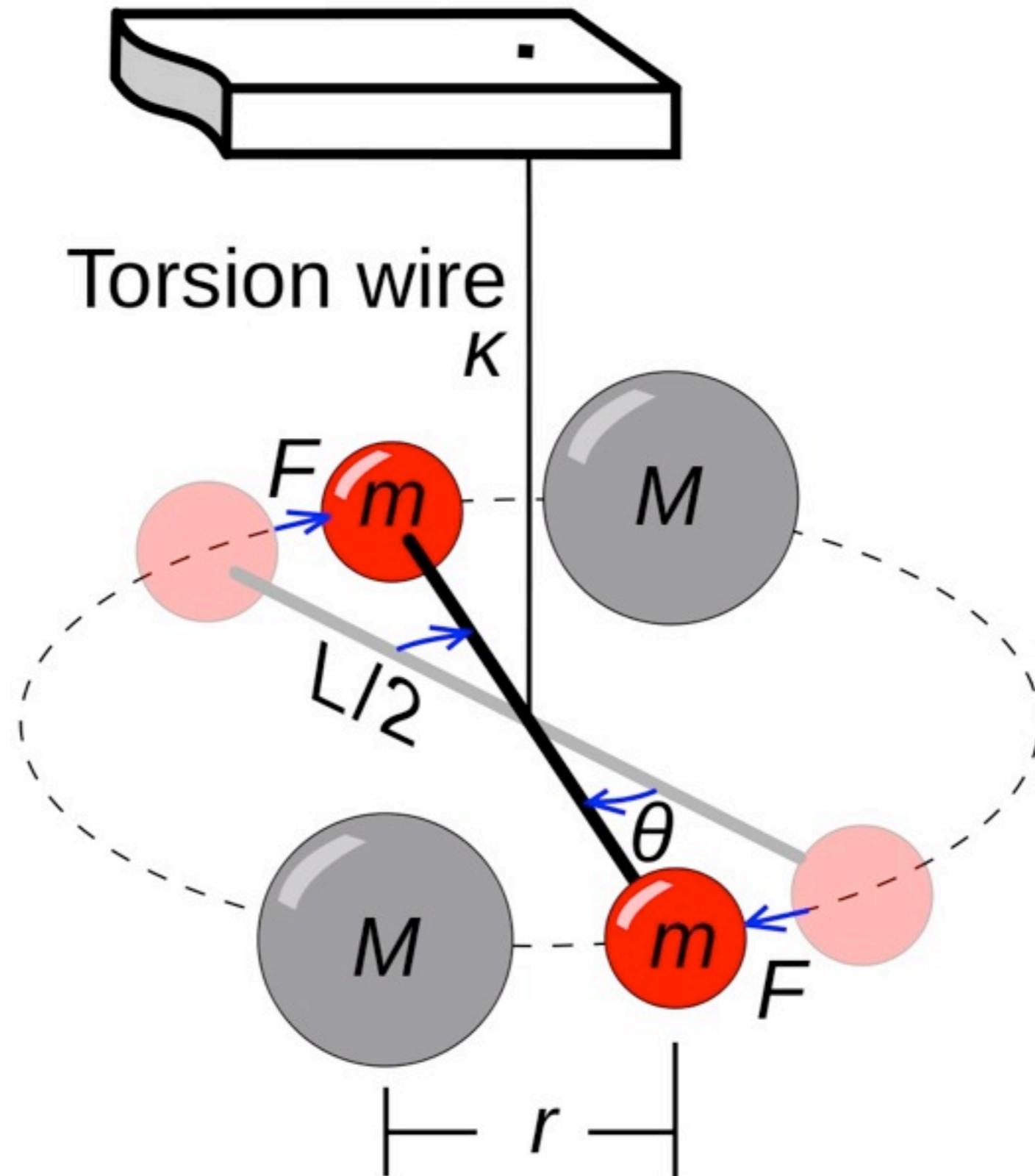If the string breaks, the inward force is gone...

string breaks

...so the ball moves with constant velocity from the point of the break.
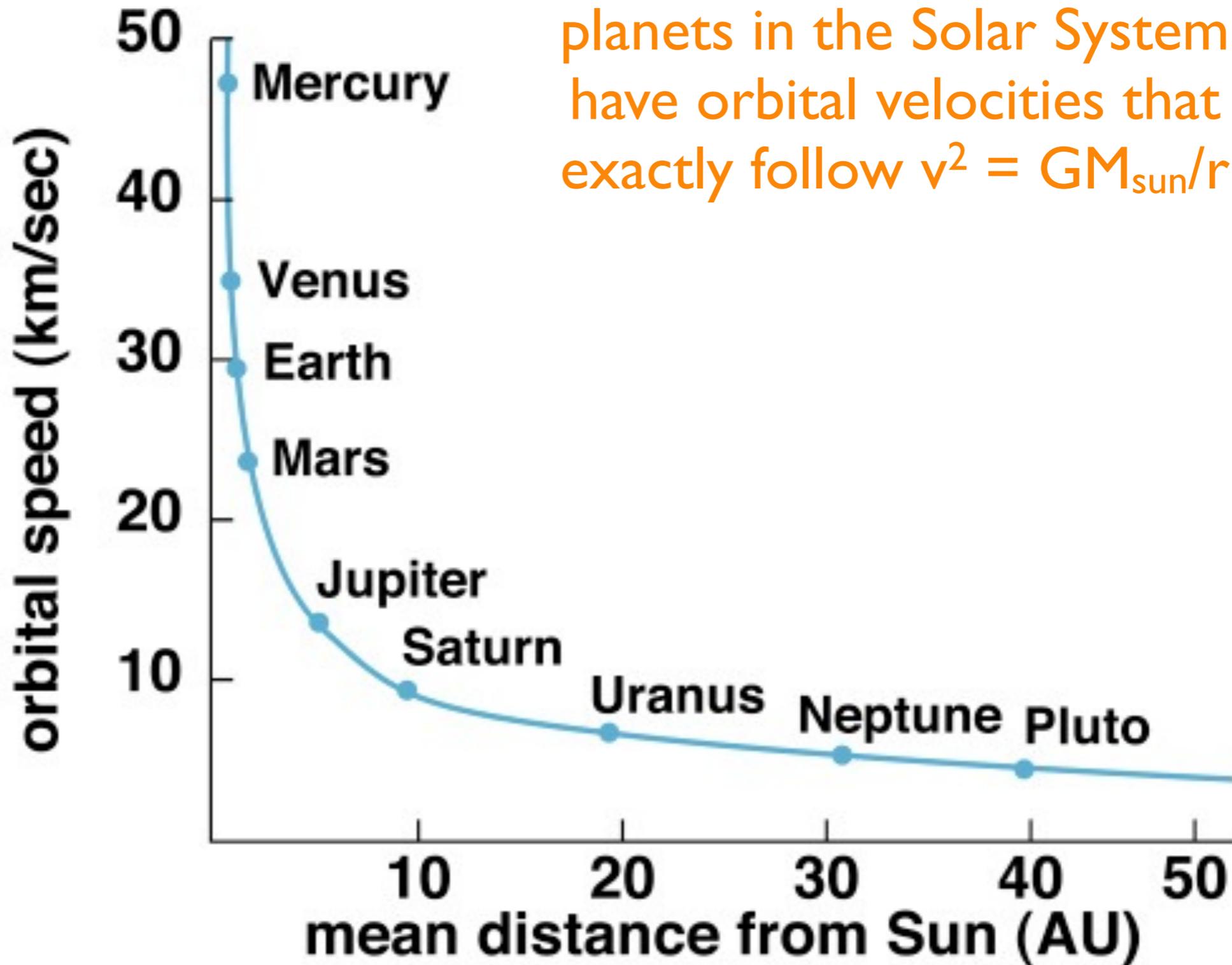
v

a When you swing a ball on a string, the string exerts a force that pulls the ball inward.

b If the string breaks, the ball flies off in a straight line at constant velocity.

Cavendish Experiment: for measuring the strength of gravity (G)

planets in the Solar System have orbital velocities that exactly follow $v^2 = GM_{sun}/r$

(b)