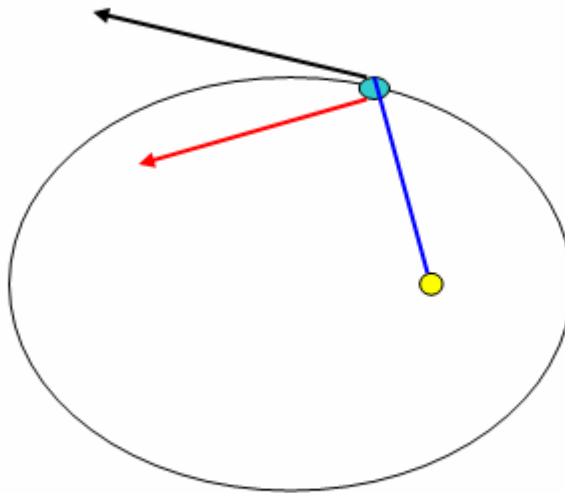


In writing *Orbits Explained* it seemed advantageous to remain consistent with existing terminology in the field of physics, despite the fact that some of the terms may be ambiguous. One existing term is so potentially misleading that it warrants this entire chapter of attention. This term will be relevant to the entire set of proofs presented in the text and can be viewed as an ambassador between established methods and our new way. The term to be clarified and preserved is "tangential velocity."



In the drawing above, suppose that a planet, drawn in blue, is traveling around a yellow Sun in an elliptically shaped orbit. We will call the imaginary straight line to the Sun, the "distance radius" or at times simply the "radius". It is represented by the solid blue line. The

arrows in the diagram are examples of velocity vectors. As described in Chapter 3, a velocity vector is an arrow whose length indicates how fast the planet is traveling and whose orientation represents the direction of travel. The actual direction and speed of travel, at the present moment in time, are both indicated by the solid black arrow. As will be explained in the main text, the solid black arrow represents the total velocity of the planet and lies on a line that is the tangent line to the orbit. The tangent line will be defined to be the line that grazes the curve of the orbit, touching it at only one point, without crossing it. The red arrow represents a different aspect of the velocity; it relates to the speed of the planet which is measured solely in the direction that is at a right angle to the distance radius to the Sun. This velocity is known as "tangential velocity". Tangential velocity and distance to the Sun are of prime concern to us throughout the text. The sole purpose of this chapter is to present the distinction between total velocity and tangential velocity in order to avoid later confusion. A potential source of confusion is the name, tangential velocity. As mentioned, "total velocity" for any planet will be shown to be along a line that is at a tangent to the orbit. But we do not refer to this as "tangential

velocity" despite the fact that it is along a line which is at a tangent to the orbit . Instead, we reserve the name "tangential velocity" for the the aspect of velocity that is at a right angle to the radius line to the Sun.

Thus, we have cleared the air of any confusion between the terms "total velocity" and "tangential velocity". We may proceed more safely.