

Example Plate Rotation Problem

Calculation of Relative Plate Motion			
Given the latitude and longitude of the pole of rotation (P) between two plates, and point X on the plate boundary, find the relative velocity and azimuth of motion for point X.			
Variable	Definition	Value	Units
λ_P	Latitude of rotation pole P	56.0000	degrees
λ_X	Latitude of point X on plate boundary	-28.0000	degrees
ϕ_P	Longitude of rotation pole P	-94.0000	degrees
ϕ_X	Longitude of point X on plate boundary	-71.0000	degrees
R	Radius of the earth	6371.0000	kilometers
ω	Angular velocity about rotation pole P	7.6000E-07	degrees/year
Find the following values using equations 2.12, 2.13, 2.7, and 2.8			
v	Velocity at point x on plate boundary		
β	Azimuth of the velocity with respect to north		
	Equation 2.12	a =	86.2571 degrees
	Equation 2.14	C =	-12.6480 degrees
	Equation 2.7	v =	8.4328 cm/year
	Equation 2.8	β =	77.3520 degrees

