Calculation of Distance from Belladonia W.A.Launch Point.
To: Borderville W.A/S.A Border. Landing Point.
Flight: F3A-21 Record Flight.
Date: 18th May, 1994.
Name: P. Garoni.

The equations for computing the great circle distance on the surface of the earth are give in equations (1) and (2) below. The arithmetic working and solution is provided.

Equation 1. $\cos S = \sin L_1 \sin L_2 + \cos L_1 \cos L_2 \cos (\lambda_2 - \lambda_1)$

Using Satellite References:
where S = angle (in degrees) subtended between two points

λ_1 = initial longitude = 123° 51' 35" E
L_1 = initial latitude = 32° 28' 5" S
λ_2 = final longitude = 129° 0' 7" E
L_2 = final latitude = 31° 38' 15" S

now $\sin L_1$ = 0•53682930
$\sin L_2$ = 0•52454325
$\cos L_1$ = 0•84369088
$\cos L_2$ = 0•85138380
$\cos (\lambda_2 - \lambda_1)$ = 0•99597529

so $\cos S$ = 0•53682930 * 0•52454325 + 0•84369088 * 0•85138380 * 0•99597529
= 0•99700397

and $\therefore$ S = 4•43628573°

Equation 2: Distance $d = \frac{R * S}{57•29578}$ where d = distance on the earth's surface
R = earth's radius = 6371•0
S = subtended angle in degrees
57•29578 = degreees per radian

and $\therefore$ Distance flown = $6371•0 \frac{km}{rad} * \frac{4•43628573°}{57•29578 \ deg/rad}$
= 493•292463 km = 493•292 km

Certified correct:

Dr. Geoff Martin
Senior Lecturer
Department of Computer Technology
Faculty of Computing and Information Technology
Monash University

Directing Official