

## TOTAL ΔV WITH IMPACT AND POST IMPACT SPEEDS AND β ANGLE

Find the Total ΔV with an Impact Speed, After Impact Speed and β Angle.

**CASE NUMBER:** A Sample Recon Case

3/16/2019

$$\Delta V_t = \sqrt{V_1^2 + V_3^2 - (2 \times V_1 \times V_3 \times \cos(\beta))}$$

$$\Delta V_t = \sqrt{45.000^2 + 15.000^2 - (2 \times 45.000 \times 15.000 \times \cos(135.000))}$$

$$\Delta V_t = \sqrt{2106.810 + 225.000 - (2 \times 45.000 \times 15.000 \times -0.707)}$$

$$\Delta V_t = \sqrt{2331.810 - -973.539}$$

$$\Delta V_t = \sqrt{3305.349}$$

$$\Delta V_t = 56.607$$

*ΔV<sub>t</sub> = The Total ΔV.  
V<sub>1</sub> = The Impact Speed.  
V<sub>3</sub> = The After Impact Speed.  
2 = A Constant.  
β = The Angle between Approach and Departure.*

**Formula Inputs:**

The Impact Speed is: 45.000  
The After Impact speed is: 15.000  
The β Angle is: 135.000

**Formula Results:**

The Total ΔV is: 56.607

**Incrementation Results**

<u>Impact Spd</u>	<u>Total ΔV</u>	<u>Impact Spd</u>	<u>Total ΔV</u>	<u>Impact Spd</u>	<u>Total ΔV</u>
44.000	55.625	44.700	56.313	45.400	57.000
44.100	55.724	44.800	56.411	45.500	57.099
44.200	55.822	44.900	56.509	45.600	57.197
44.300	55.920	45.000	56.607	45.700	57.295
44.400	56.018	45.100	56.706	45.800	57.393
44.500	56.116	45.200	56.804	45.900	57.492
44.600	56.214	45.300	56.902		