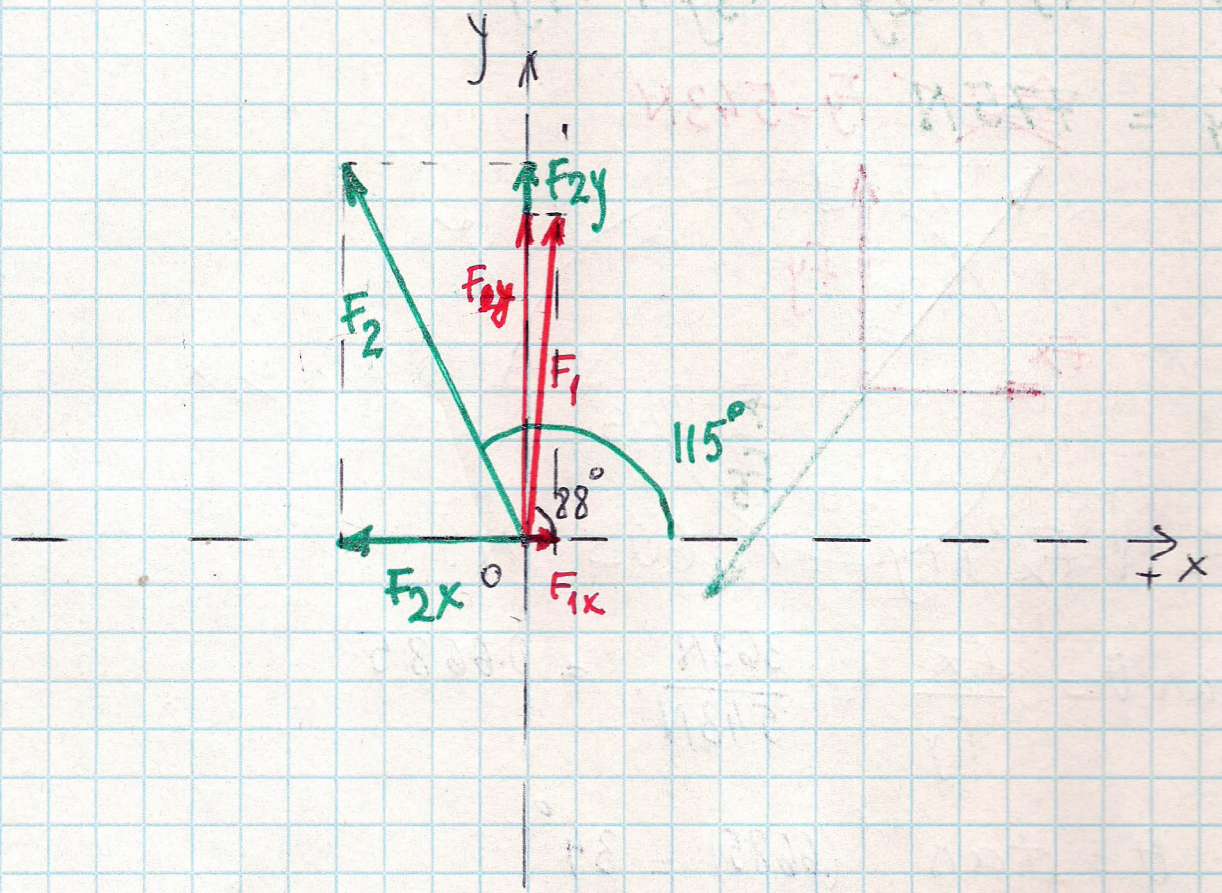
Vector addition Practice Problem with angles in standard notation



$F_{1x} = F_1 \cdot \cos 88^\circ = 375\,N \cdot \cos 88^\circ = 13.1\,N$

$F_{1y} = F_1 \cdot \sin 88^\circ = 375\,N \cdot \sin 88^\circ = 374.8\,N$

$F_{2x} = F_2 \cdot \cos 115^\circ = 525\,N \cdot \cos 115^\circ = -222\,N$

$F_{2y} = F_2 \cdot \sin 115^\circ = 525\,N \cdot \sin 115^\circ = 476\,N$

$F_{3x} = F_3 \cdot \cos 187^\circ = -412\,N$

$F_{3y} = F_3 \cdot \sin 187^\circ = -50.2\,N$

$F_{4x} = F_4 \cdot \cos 315^\circ = 258\,N$

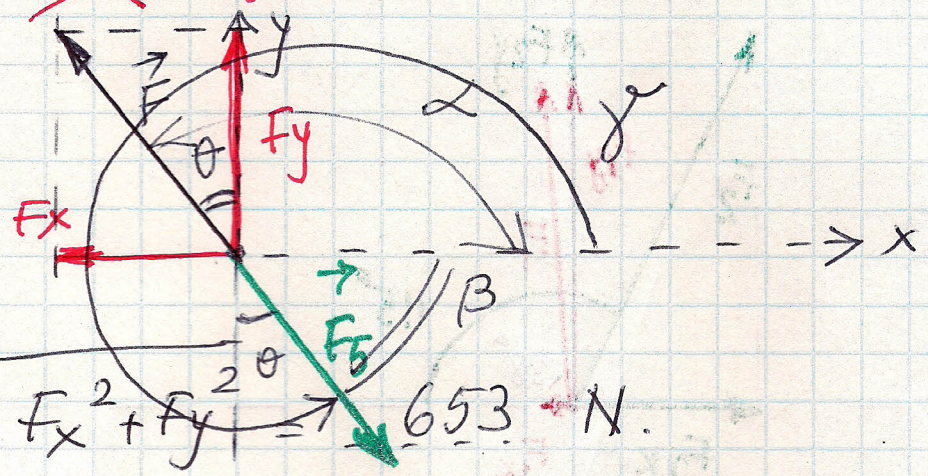
$F_{4y} = F_4 \cdot \sin 315^\circ = -258\,N$

$F_x = F_{1x} + F_{2x} + F_{3x} + F_{4x}$

$F_x = -362.5N \simeq -363N$

$F_y = F_{1y} + F_{2y} + F_{3y} + F_{4y}$

$F_y = \cancel{-335N}$ $F_y = 543N$



$F = \sqrt{F_x^2 + F_y^2} = 653 \text{ N}.$

$\tan\theta = \frac{F_x}{F_y} = \frac{363N}{543N} = 0.6685$

$\theta = \tan^{-1}(.6685) = 34^\circ$

$\alpha = 90^\circ + \theta = 90^\circ + 34^\circ = 124^\circ$

$F_5 = F = 653\,N$

$\beta = 90^\circ - \theta = 90^\circ - 34^\circ = 56^\circ$

$\gamma = 360^\circ - \beta = 360^\circ - 56^\circ = 304^\circ$

$F_5 = 653N$, angle $\gamma = 304^\circ$ counter-clock wise from x+