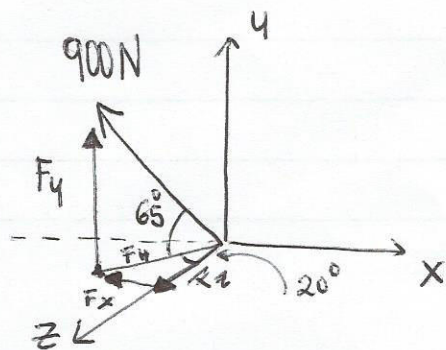


Serie 2 Procedimientos

2.71)



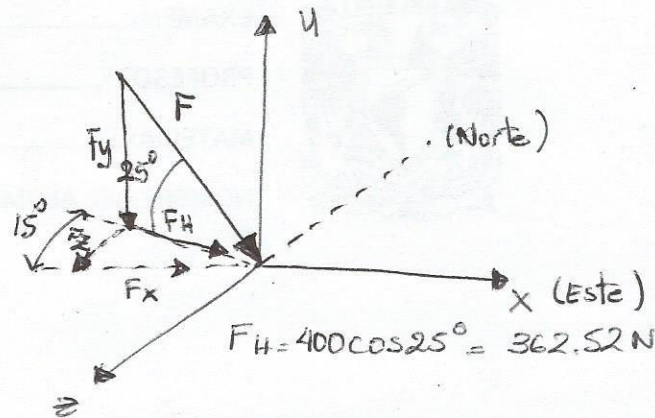
$$F_H = F \sin 25^\circ = 380.36 \text{ N}$$

$$F_x = F_H \cos 110^\circ = -F_H \sin 20^\circ = -130.09 \text{ N}$$

$$F_y = F \sin 65^\circ = 815.68 \text{ N}$$

$$F_z = F_H \sin 110^\circ = F_H \cos 20^\circ = 357.42 \text{ N}$$

2.74)



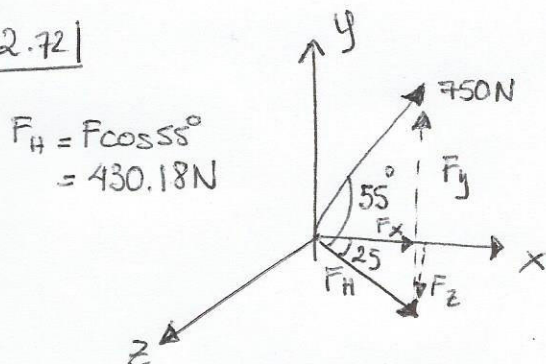
$$F_H = 400 \cos 25^\circ = 362.52 \text{ N}$$

$$F_x = F_H \cos 15^\circ = 350.17 \text{ N}$$

$$F_y = -F \sin 25^\circ = -169.047 \text{ N}$$

$$F_z = F_H \sin 15^\circ = 93.827 \text{ N}$$

2.72)



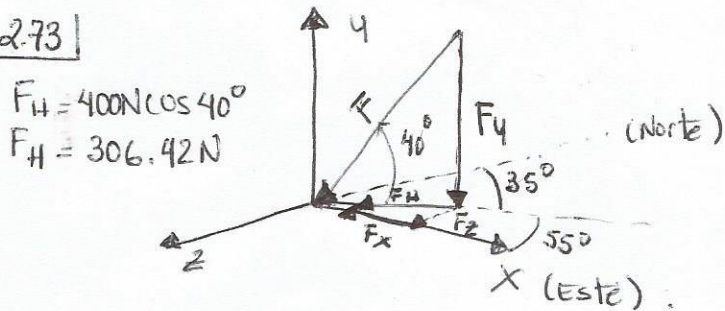
$$F_H = F \cos 55^\circ = 430.18 \text{ N}$$

$$F_x = F_H \sin 65^\circ = 389.88 \text{ N}$$

$$F_y = F \sin 55^\circ = 614.36 \text{ N}$$

$$F_z = F_H \cos 65^\circ = 181.80 \text{ N}$$

2.73)



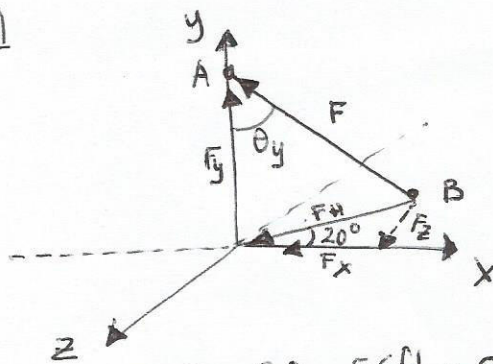
$$F_H = 400 \text{ N} \cos 40^\circ = 306.42 \text{ N}$$

$$F_x = -F_H \cos 55^\circ = -175.76 \text{ N}$$

$$F_y = -F \sin 40^\circ = -257.12 \text{ N}$$

$$F_z = F_H \sin 55^\circ = 251 \text{ N}$$

2.75)



usando que $\cos \theta_y = \frac{c.a}{h} = \frac{56 \text{ ft}}{65 \text{ ft}} \Rightarrow \theta_y = 30.51^\circ$

$$\Rightarrow F_x = -F \sin \theta_y \cos 20^\circ = -1864 \text{ lb}$$

$$F_y = F \cos \theta_y = 3360 \text{ lb}$$

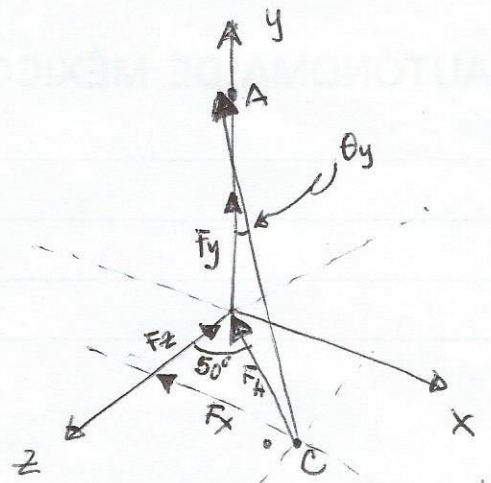
$$F_z = F \sin \theta_y \sin 20^\circ = 677 \text{ lb}$$

Para encontrar los otros angulos usamos:

$$\cos \theta_x = \frac{F_x}{F} \Rightarrow \theta_x = 118.5^\circ$$

$$\cos \theta_z = \frac{F_z}{F} \Rightarrow \theta_z = 80.0^\circ$$

2.76 |



Se usa la misma idea $\theta_y = \cos^{-1}\left(\frac{c.a}{n}\right)$

$$\theta_y = \cos^{-1}\left(\frac{56ft}{70ft}\right) \Rightarrow \theta_y = 36.870^\circ$$

$$F_H = F \sin \theta_y = 3150.0 \text{ lb}$$

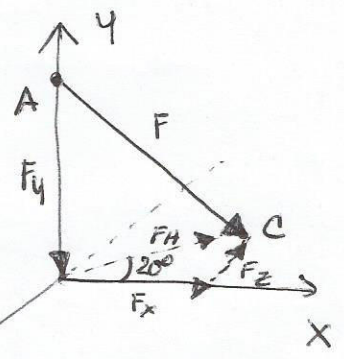
$$F_x = -F_H \sin 50^\circ = -2413.04 \text{ lb}$$

$$F_y = F \cos \theta_y = 4200.0 \text{ lb}$$

$$F_z = -F_H \cos 50^\circ = -2024.8 \text{ lb}$$

2.77 |

lo que siente el punto A



$$F_H = 120 \text{ lb} \cos 60^\circ = 120 \text{ lb} \sin 30^\circ$$

$$\Rightarrow F_x = 120 \cos 60^\circ \cos 20^\circ = 56.382 \text{ lb}$$

$$F_y = -120 \sin 60^\circ = -103.923 \text{ lb}$$

$$F_z = -120 \cos 60^\circ \sin 20^\circ = -20.521 \text{ lb}$$

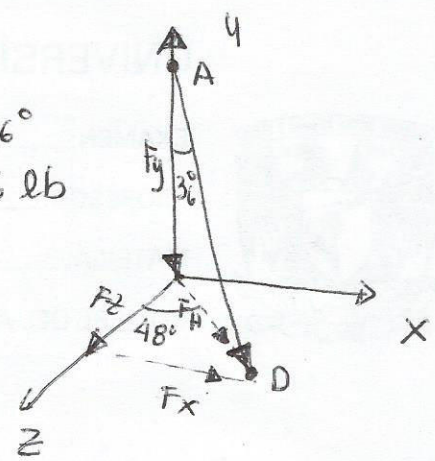
luego usamos

$$\cos \theta_x = \frac{F_x}{F} \Rightarrow \theta_x = 62.0^\circ$$

$$\cos \theta_y = \frac{F_y}{F} \Rightarrow \theta_y = 150.0^\circ$$

$$\cos \theta_z = \frac{F_z}{F} = \frac{-20.52}{120} \Rightarrow \theta_z = 99.8^\circ$$

2.78 |



$$F_H = F \sin 36^\circ$$

$$F_H = 49.96 \text{ lb}$$

$$F_x = F_H \sin 48^\circ = 37.129 \text{ lb}$$

$$F_y = -85 \text{ lb} \cos 36^\circ = -68.8 \text{ lb}$$

$$F_z = F_H \cos 48^\circ = 33.431 \text{ lb}$$

2.79 |

$$\|F\| = \sqrt{F_x^2 + F_y^2 + F_z^2} = 950 \text{ N}$$

$$\Rightarrow \theta_x = \cos^{-1} \frac{F_x}{F} = 43.4^\circ$$

$$\theta_y = \cos^{-1} \frac{F_y}{F} = 71.6^\circ$$

$$\theta_z = \cos^{-1} \frac{F_z}{F} = 127.6^\circ$$

2.80 |

Mismo procedimiento que en 2.79 |

$$\|F\| = 1050 \text{ N}$$

$$\theta_x = 54.8^\circ, \theta_y = 107.7^\circ, \theta_z = 43.6^\circ$$

2.81 |

usamos

$$\cos^2 \theta_x + \cos^2 \theta_y + \cos^2 \theta_z = 1$$

$$\cos \theta_y = \pm 0.72100$$

Pero como F_y es positiva

\Rightarrow usamos $\cos \theta_y = +0.72100$ para el cual $\theta_y = 43.9^\circ$.

luego de $F_y = F \cos \theta_y$ despejamos

$$F \Rightarrow F = 416.09 \text{ lb}$$

$$\therefore F_x = F \cos \theta_x = 107.7 \text{ lb}$$

$$F_z = -267 \text{ lb}$$

RESULTADOS SERIE 2

2.71

$$F_x = -130.1 \text{ N}, F_y = 816 \text{ N}, F_z = 357 \text{ N}$$
$$\theta_x = 98.3^\circ, \theta_y = 25^\circ, \theta_z = 66.6^\circ$$

2.72

$$F_x = 390 \text{ N}, F_y = 614 \text{ N}, F_z = 181.8 \text{ N}$$
$$\theta_x = 58.7^\circ, \theta_y = 35.0^\circ, \theta_z = 76.0^\circ$$

2.73

$$F_x = -175.8 \text{ N}, F_y = -257 \text{ N}, F_z = 251 \text{ N}$$
$$\theta_x = 116.1^\circ, \theta_y = 130^\circ, \theta_z = 51.1^\circ$$

2.74

$$F_x = 350 \text{ N}, F_y = -169.0 \text{ N}, F_z = 93.8 \text{ N}$$
$$\theta_x = 28.9^\circ, \theta_y = 115^\circ, \theta_z = 76.4^\circ$$

2.75

$$F_x = -1861 \text{ lb}, F_y = 3360 \text{ lb}, F_z = 677 \text{ lb}$$
$$\theta_x = 118.5^\circ, \theta_y = 30.5^\circ, \theta_z = 80^\circ$$

2.76

$$F_x = -2413 \text{ lb}, F_y = 4200 \text{ lb}, F_z = -2025 \text{ lb}$$
$$\theta_x = 117.4^\circ, \theta_y = 36.9^\circ, \theta_z = 112.7^\circ$$

2.77

$$F_x = 56.4 \text{ lb}, F_y = -103.9 \text{ lb}, F_z = -20.5 \text{ lb}$$
$$\theta_x = 62.0^\circ, \theta_y = 150.0^\circ, \theta_z = 99.8^\circ$$

2.78

$$F_x = 37.1 \text{ lb}, F_y = -68.8 \text{ lb}, F_z = 33.4 \text{ lb}$$
$$\theta_x = 64.1^\circ, \theta_y = 144.0^\circ, \theta_z = 66.8^\circ$$

2.79

$$F = 950 \text{ N}$$

$$\theta_x = 43.4^\circ, \theta_y = 71.6^\circ, \theta_z = 127.6^\circ$$

2.80

$$F = 1050 \text{ N}$$

$$\theta_x = 51.8^\circ, \theta_y = 107.7^\circ, \theta_z = 43.6^\circ$$

2.81

$$F = 416 \text{ lb}$$

$$\theta_y = 43.9^\circ$$

$$F_x = 107.7 \text{ lb}$$

$$F_z = -267 \text{ lb}$$