

Subjects ▾

Problem 262 | Resultant of Non-Concurrent Force System

Problem 262

Determine completely the resultant of the forces acting on the step pulley shown in Fig. P-262.

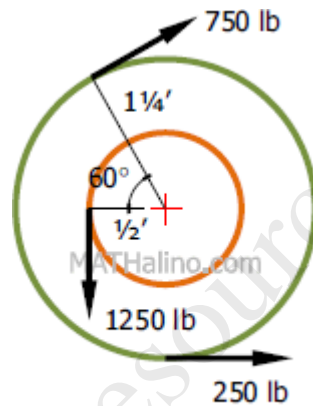


Figure P-262

Solution 262

[Click here to show or hide the solution](#)

$$R_x = \Sigma F_x$$

$$R_x = 750 \sin 60^\circ + 250$$

$$R_x = 899.52 \text{ lb to the right}$$

$$R_y = \Sigma F_y$$

$$R_y = 750 \cos 60^\circ - 1250$$

$$R_y = -875 \text{ lb}$$

$$R_y = 875 \text{ lb downward}$$

$$R = \sqrt{R_x^2 + R_y^2}$$

$$R = \sqrt{899.52^2 + 875^2}$$

$$R = 1254.89 \text{ lb}$$

$$\tan \theta_x = \frac{R_y}{R_x}$$

$$\tan \theta_x = \frac{875}{899.52}$$

$$\theta = 44.21^\circ$$

$$M_{axle} = \sum M_{center}$$

$$M_{axle} = 250(1.25) + 1250(0.5) - 750(1.25)$$

$$M_{axle} = 0$$

Thus, $R = 1254.89 \text{ lb}$ downward to the right at $\theta = 44.21^\circ$ and passes through the axle.

Tags: [resultant](#) [step pulley](#) [Two-Step Pulley](#)

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