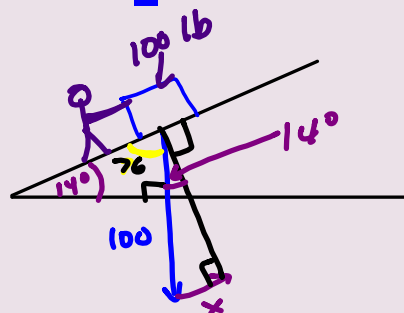
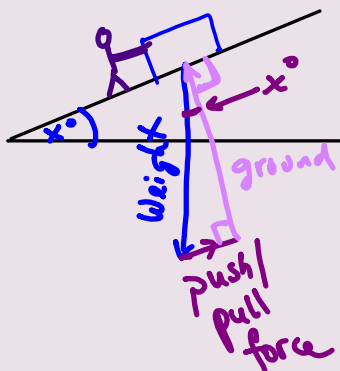


INCLINE PROBLEMS



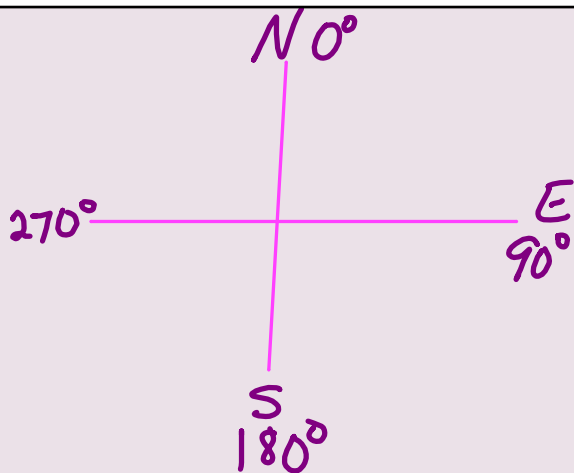
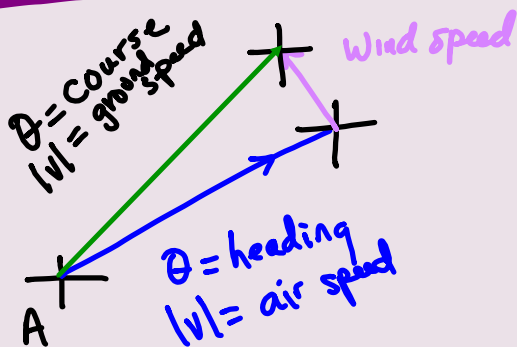
How much force must the delivery man apply?

$$\frac{x}{\sin 14^\circ} = \frac{100}{\sin 90^\circ}$$

$$x = 100 \sin 14^\circ$$

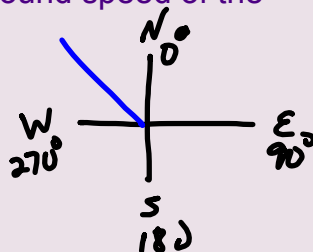
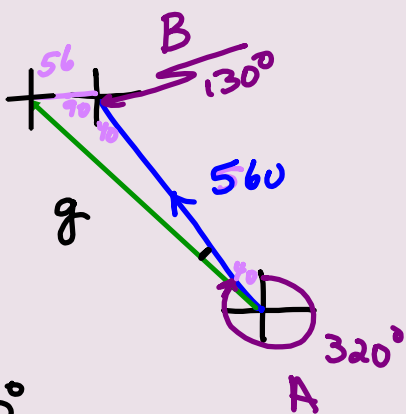
$$x = 24.2 \text{ lb.}$$

NAVIGATION



bearing = direction

A pilot flying with an air speed of 560 mph travels on a heading of 320 degrees. If the wind is blowing from the east at 56 mph, find the course and ground speed of the plane.



$$\begin{array}{r} 320^\circ \\ - 4^\circ \\ \hline 316^\circ \end{array}$$

600 mph @ 316°

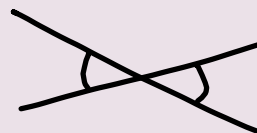
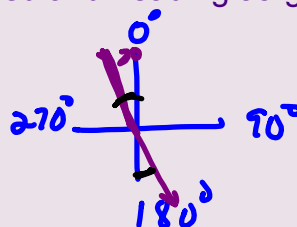
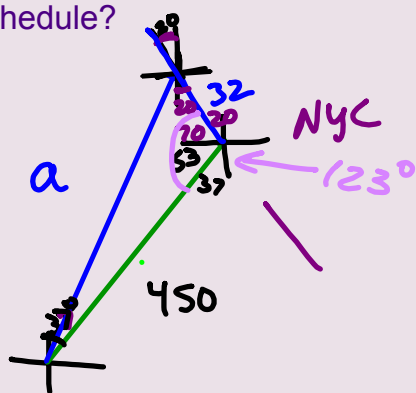
$$g^2 = 56^2 + 560^2 - 2(56)(560)\cos 130^\circ$$

$$g = 597 \approx 600 \text{ mph}$$

$$\frac{\sin A}{56} = \frac{\sin 130^\circ}{600}$$

$$A = 4^\circ$$

To fly from Seneca to New York City and arrive on time, Jorge must maintain a course of 37 degrees and a ground speed of 450 mph. However, the wind is blowing from the direction 340 degrees at 32 mph. What is the necessary air speed and heading Jorge must use to arrive on schedule?



$$\begin{array}{r} 37^\circ \\ - 3^\circ \\ \hline 34^\circ \end{array}$$

$$a^2 = 450^2 + 32^2 - 2(450)(32)\cos 123^\circ$$

$$a = 468 \approx 470 \text{ mph}$$

$$\frac{\sin A}{32} = \frac{\sin 123^\circ}{470}$$

$$A = 3^\circ$$

470 mph @ 39°

