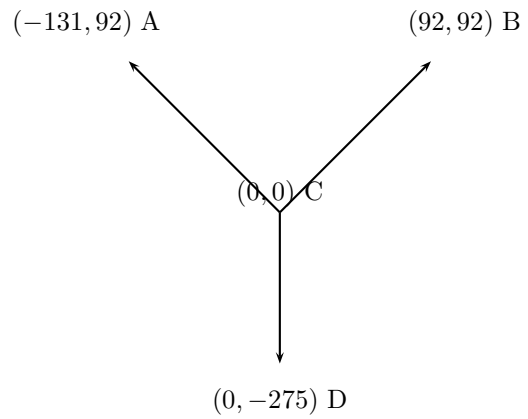
The following are a collection of problems I hope to go over if no one has any questions on the homework. If they do have questions on the homework, all the better, this will be available to read.

For this problem (36,10.1) we have that two ropes are attached to a large crate at point C. Suppose that rope A exerts a force of $(-131, 92)$ pounds on the crate and rope B exerts a force of $(92, 92)$ pounds on the crate. If the crate



weighs 275 pounds what is the net force acting on the crate.
WARNING Drawing not to metric scale

$$\overrightarrow{CA} + \overrightarrow{CB} + \overrightarrow{CD} = (-131 + 92 + 0, 92 + 92 - 275) = (-131 + 92, 2 \cdot 92 - 275) = \tag{1}$$

$$(-39, -91) \tag{2}$$

For the next problem (38,10.1) we have that if the thrust of an airplane's engines produces a speed of 600 miles per hour in the air, while the wind's velocity is given by $(-30, 60)$. In what direction should the airplane head to fly due west.

Give the airplane's velocity vector by (x, y). Then take the final velocity vector to be $(x - 30, y + 60) = (-c, 0)$ for $c > 0$. Then since $y + 60 = 0$ we know that $y = -60$. This means that the airplanes velocity is in the direction of $(x, -60)$. This means that their speed should be

$$\sqrt{x^2 + 60^2} = 600 \tag{3}$$

Then squaring we get that

$$x^2 + 60^2 = 600^2 \tag{4}$$

$$x^2 = 356400 \tag{5}$$

$$x = \pm\sqrt{356400} \tag{6}$$

Since we are flying westward take $x = -\sqrt{356400}$. Thus the airplane's velocity is in the direction of $(-\sqrt{356400}, -60)$.

For this problem (51,10.2) we have two ropes are attached to another large crate weighing 500 pounds, at a point C. Suppose that rope A exerts a force of $(10, -130, 200)$ pounds on the crate and rope B exerts a force of $(-20, 180, 160)$ pounds on the crate. If no further ropes are added, find the net force on the crate and the direction it will move. If a third rope C is added to balance the crate, what force must this rope exert on the crate.

Take $\overrightarrow{CA}+\overrightarrow{CB}+\overrightarrow{G} = (10-20, 180-130, 160+200-500) = (-10, 50, -140) = 10(-1, 5, -14)$. This means that a rope should exert a force in $(10, -50, 140)$ pounds to equalize.