

1. A Piano weighing 500 lbs. is being pushed up a ramp into the back of a truck. The ramp is a board that can support 450 lbs. and makes a 30 degree angle with the horizontal. Will the ramp support the piano?
2. A plane has set a bearing of S 60° E at 600mph, but there is a wind blowing in the direction of N 45° E at 80 mph. What is the resultant speed and direction of the plane?
3. A man wishes to paddle a canoe across a river to the point directly opposite to his starting point. The river flows 3mph and he will paddle 6 mph. In what direction should he aim the canoe?
4. Find a vector of length 3 which has the same direction as $5\mathbf{i}-2\mathbf{j}$.
5. Find a vector in the same direction as $6\mathbf{i}-2\mathbf{j}$ that has three times its length.

6. Consider an object P with the following forces acting upon it.

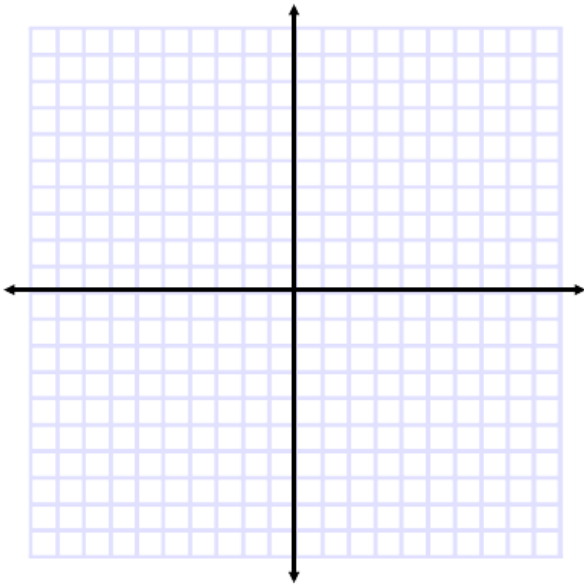
$$F_1 = \langle 4, -2 \rangle$$

$$F_2 = \langle 0, -4 \rangle$$

$$F_3 = \langle -2.5, 0 \rangle$$

$$F_4 = \langle -1, 4 \rangle$$

Draw the point/object P and the forces acting upon it on the grid.



Now find a 5th force F_5 that will cause the object P to be in static equilibrium. That means that the sum of all 5 forces will be zero.

7. Find the tension in the wires from which the weight is suspended.

