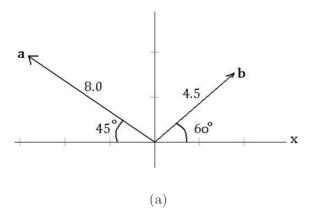
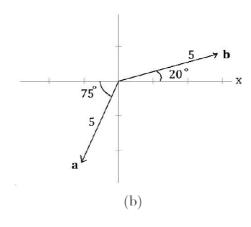
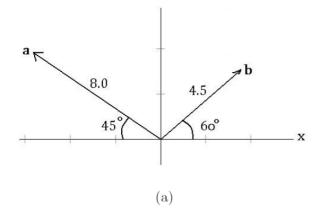
Section D: Applications of vectors

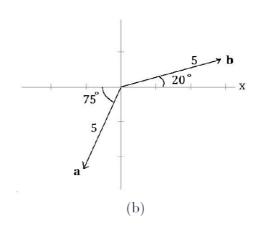
1. Draw $\vec{a} + \vec{b}$



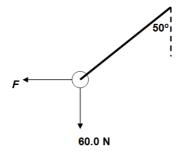


2. Draw $\vec{a} - \vec{b}$

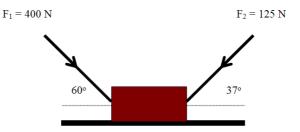




3. A ball is held at an angle of 50° to the vertical. If the ball weighs 60.0 N, find the horizontal force F needed to hold it there.

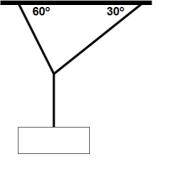


4. A 20 kg mass initially at rest on a frictionless surface is subjected to two forces as shown in the diagram. Calculate the magnitude and direction of the resultant **horizontal force** acting on the mass.

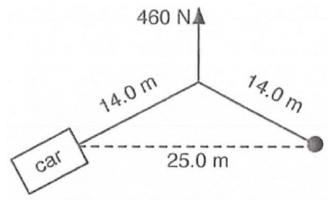


5. Alex, James and Tom are pulling a metal ring. Alex pulls with a force of 100.0 N North, James with a force of 140.0 N East and Tom exerts a force of 172.0 N, W 35° S. determine whether the ring moves and in what direction?

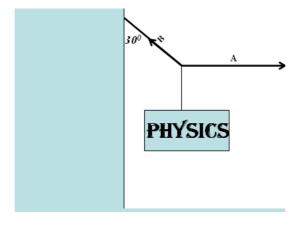
6. A 150 N bird feeder is supported by three cables as shown below. Find the tension in each cable.



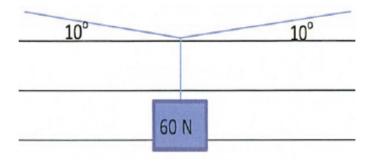
7. To pull a car from a ditch, a rope 28.0 m long is tied to the car and to a post that is 25.0 m away. A force of 460.0 N is applied to the centre of the rope as shown in the diagram. Calculate the tension in the rope.



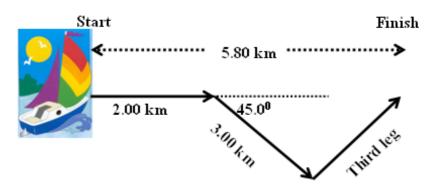
8. Mr Jaldiani wishes to hang the Physics sign weighing 750 N so that a cable **B** attached to the Physics department makes an angle of 30° as shown. Cable **A** is attached to an adjoining building. Calculate the necessary tension in cable **B** using a vector diagram and reasoning.



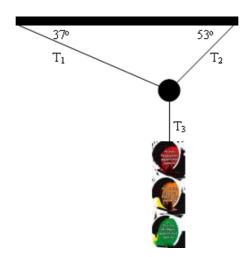
9. A weightless clothes line is hung loosely between two trees. An object with a weight of 60.0 N is hung at the centre as shown in the diagram. What is the tension in the line if $\theta = 10.0^{\circ}$?



10. A sailor in a small sailboat encounters shifting winds as shown below. Find the magnitude and direction of the third leg of the journey.



11. A traffic light weighing 100 N hangs from a cable tied to two other cables fastened to a support as shown below.



a) Complete the table below:

Name	x-component	y-component
T_1		
T ₂		
T ₃		
T_R		

b) Hence find the tension in the three cables.					

12. What is F if the sum of all the forces in the diagram is zero?

