

Vectors in 2D: Exam Revision Tracker



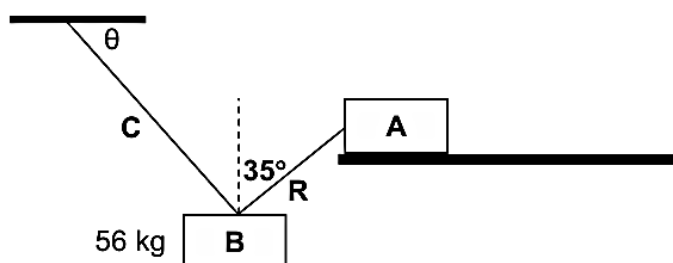
Attempt #1		Attempt #2		Attempt #3		Attempt #4		Attempt #5	
Total	Score	Total	Score	Total	Score	Total	Score	Total	Score
13		11		15		12		12	
Percentage =		Percentage =		Percentage =		Percentage =		Percentage =	

Vectors in 2D: Attempt #1



Total = 13 Marks

Block **A**, which is at rest on a horizontal rough surface, is used as an anchor to hold block **B**, with a mass of 56 kg, in the air at a certain height above the ground. The two blocks are connected with rope **R**, which makes an angle of 35° with the vertical. Block **B** is suspended from the ceiling with cable **C**. Refer to the diagram below.



Block **A** experiences a frictional force of magnitude 200 N. The system is stationary.

1. Define the term *resultant vector*. (2)
2. What is the magnitude of the resultant force acting on block **B**? (1)
3. Draw a labelled free-body diagram indicating all the forces acting on block **B**. (3)
4. Determine the horizontal component of the force in rope **R**. (1)
5. Calculate the vertical component of the force in cable **C**. (4)
6. Calculate the angle θ between the cable and the ceiling. (2)

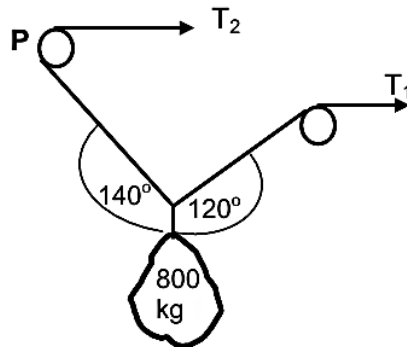
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Vectors in 2D: Attempt #2 ⚡

Total = 11 Marks

The diagram below shows a rope and pulley arrangement of a device being used to lift an 800 N object. Assume that the ropes are light and inextensible and also that the pulley is light and frictionless.



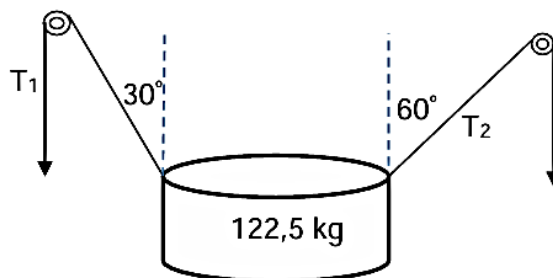
Determine the:

1. Magnitudes of the tensions T_1 and T_2 (7)
2. Magnitude and direction of the reaction force at pulley P (4)

Vectors in 2D: Attempt #3 ⚡

Total = 15 Marks

The diagram below shows a rope and pulley system of a device being used to lift a 122,5 kg container upwards at a constant velocity. Assume that the ropes are light and inextensible and the pulley is frictionless.



1. Calculate the weight of the container. (3)
2. The system is moving upwards at a constant velocity as indicated above.
 - 2.1 Draw a vector diagram of all forces acting on the container and indicate the angles represented in the diagram. (5)
 - 2.2 Determine the magnitudes of the forces T_1 and T_2 . (7)

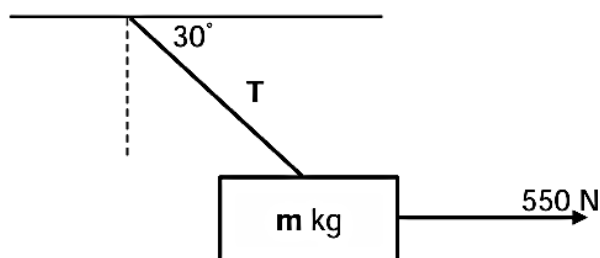
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Vectors in 2D: Attempt #4 ⚡

Total = 12 Marks

A 550 N force is applied horizontally on a block of mass m kg by means of a massless inextensible rope. The block remains stationary when the angle that the rope makes with the horizontal is 30° .

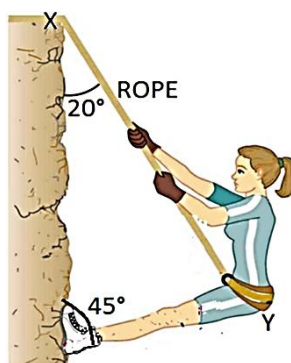


1. Explain why the block is stationary. (2)
2. Use either calculation or construction to determine the tension, T , in the rope. Use a scale of 1 cm : 100 N. (4)
3. Calculate the mass of the block. (6)

Vectors in 2D: Attempt #5 ⚡

Total = 12 Marks

During a mountain climbing exercise, Ferial, mass 50 kg, is suspended from an inelastic piece of nylon rope, fixed to a vertical cliff at X on the cliff. She pushes her legs against the cliff so that they make an angle of 45° with the cliff, as indicated in figure. The angle that the rope makes with the cliff is 20° .



Point Y is in equilibrium.

1. Explain what is meant by Point Y is in equilibrium. (1)
2. Draw a FORCE DIAGRAM showing all the forces acting on point Y. (3)
3. Determine by means of ACCURATE CONSTRUCTION and MEASUREMENT. (use the scale 10 mm: 50 N and indicate at least TWO angles):
 - 3.1 The magnitude of the force which the rope exerts on her.
 - 3.2 The magnitude of the force exerted by her legs. (8)

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