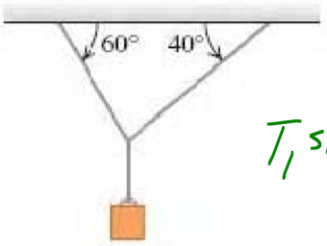
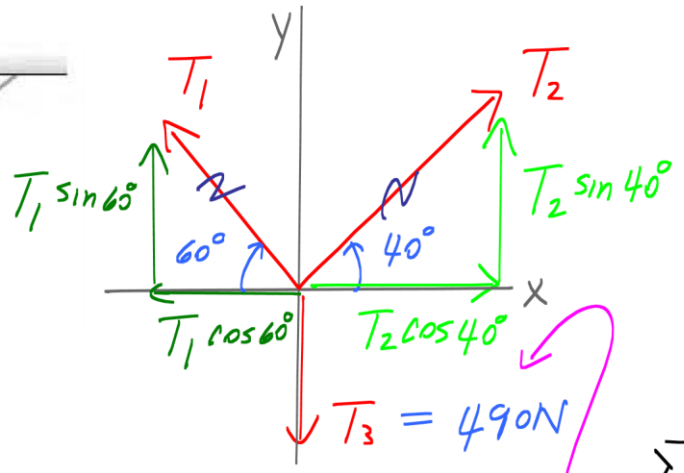
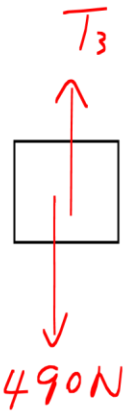






$$\sum F_y = 0$$

$$T_3 - 490N = 0$$

$$T_3 = 490N$$

$$\sum F_x = 0 \Rightarrow T_2 \cos 40° - T_1 \cos 60° = 0$$

Solving for T_2 in terms of T_1 we find

$$T_2 = T_1 \cos 60° / \cos 40° \quad \text{or} \quad \boxed{T_2 = 0.653 T_1}$$

$$\sum F_y = 0 \Rightarrow T_2 \sin 40° + T_1 \sin 60° - 490N = 0$$

Substituting $T_2 = 0.653 T_1$ for T_2 we find

$$(0.653 T_1) \sin 40° + T_1 \sin 60° = 490N$$

factoring T_1 we find

$$T_1 (0.653 \sin 40° + \sin 60°) = 490N$$

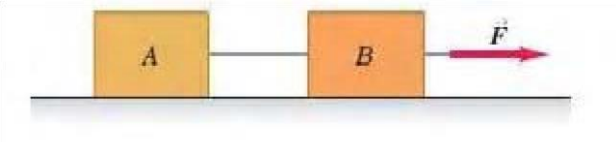
$$T_1 = \frac{490N}{0.653 \sin 40° + \sin 60°} = \boxed{381\ N}$$

Now, substitute $T_1 = 381\ N$ into $T_2 = 0.653 T_1$

i.e., $T_2 = 0.653(381N) = \boxed{249N}$

12. Find the tension in each cord if the weight of the suspended object is 490 N.

16. Two objects A and B on a perfectly horizontal surface are connected by a light cord. The mass of A is greater that of B. A horizontal force $\vec{F}$



than is applied to Q as shown in the figure below, accelerating the bodies to the right.

The magnitude of the force exerted by the connecting cord on body P will be

(a) less than F but not zero. (c) zero.
(b) greater than F. (d) equal to F.

Ans. A