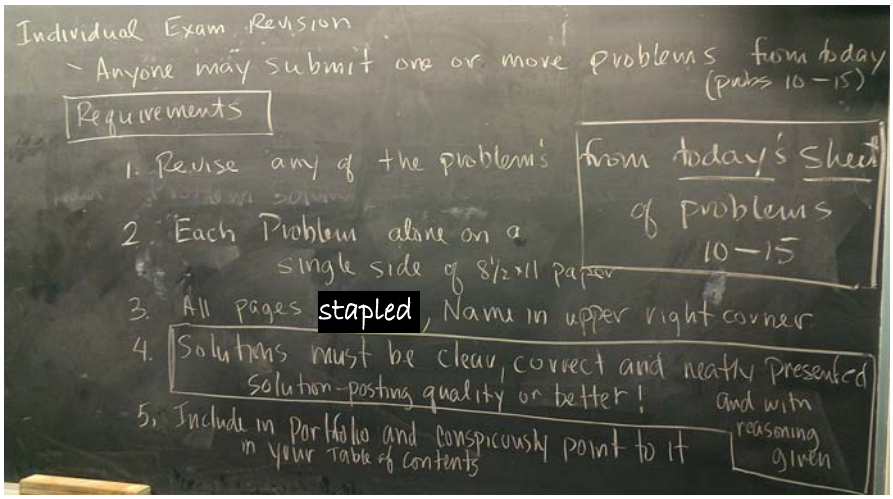
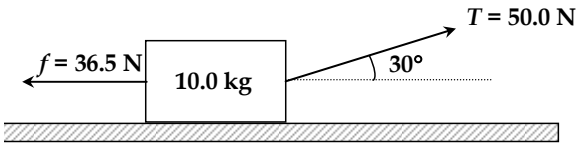
Submit High Quality Solutions to any of the following problems for your Individual Exam 2 Revision.



6. Metacognitive Reflection not required.

10. A 10.0 kg block is pulled to the right along a rough, flat surface, by a rope. As shown in the figure, the magnitude of the tension force T is 50.0 N and the magnitude of the friction force f is 36.5 N.
a) Determine the magnitude of the acceleration of the block.
b) Determine the magnitude of the normal force of the floor on the block.



11. To estimate the height of a building h, two students find the angle of elevation from a point (at ground level) down the street from the building to the top of the building is 39°. From a point that is 300 feet closer to the building, the angle of elevation (at ground level) to the top of the building is 50°. Assume that the street is level. Determine h.

12. Sam is originally standing by a dead spider. He walks 50.0 meters in a direction 30^{o} west of north, where he runs into Gollum. Sam turns and runs 100.0 meters due west. He finds a Ring of Power, turns, and walks 75.0 meters due south, where he stops at his final position. Determine the magnitude and direction of the resultant displacement vector pointing from Sam's original position to Sam's final position.

13. You are riding on a ferris wheel that moves at constant angular speed. At t = 0 minutes, you are at the very **bottom** of the ferris wheel. The function $h(t) = -12\cos\left(\frac{\pi}{10}t\right)+16$ gives your height h in meters above the ground t minutes after you were at the bottom.
a) How high above the ground are you at t = 10 minutes? Answer in 2 different ways.
b) You realize that you are terrified of heights above 20 meters. In one full revolution, for how long are you terrified?

14. A radioactive material decays at a daily rate of 15% per day. The approximate amount $A(t)$ of the radioactive material (in mg) after t days is given by the function $A(t) = 50(0.85)^t$. Determine the half-life of this radioactive material, accurate to 2 decimal places. Note: note all calculators have an arbitrary base log button; solve this problem using log rules and log or ln (which all scientific calculators should have).

15. $1000 is deposited into Bank Account A, which has an annual (compound) interest rate of 5% per year. At the same time, $900 is deposited into Bank Account B, which has an annual (compound) interest rate of 5.25% per year. Assume that no money is withdrawn from the accounts and that only the interest is added to the accounts. Determine when (accurate to 2 decimal places) the bank accounts have the same amount of money. You may use a graphical or numerical/table/guess&check/trial&error approach to check your answer, but the goal is to solve it analytically using log rules.