A ball with a mass of 1 kg moves from a height of 1 meter to a height of 2 meters. The work done by gravity on the ball is:

1) 0 J

2) Roughly +10 J

3) Roughly −10 J

4) Roughly +20 J

5) Roughly −20 J

6) Question can't be answered without knowing the initial and final speeds

7) Question can't be answered without knowing whether it moves straight up or takes some other path.

8) None of the above.

Suppose you want to ride your mountain bike up a hill. You can either charge straight up the hill or take a less-steep spiral path that is much longer. Assume that you start and end at rest. Which of the following is true?
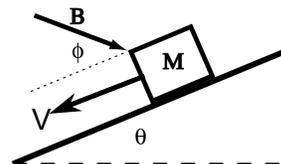
1) On the long path, you will do less work but it will take more time.

2) The longer time it takes you to get up the spiral path means you do more work.

3) The longer distance of the spiral path means that you need to do more work.

4) You need to exert more force to get up the steep path so you need to do more work.

5) You need to exert more force to get up the steep path but since the time is shorter the work is less.

6) You can exert less force to get up the spiral path but the distance is longer so the work is the same either way.

7) None of the above.

A box is moving ***up*** an incline at a constant speed, V. The box has mass M. There is friction between the box and the incline and an external force of magnitude B and angle as shown acts on the box. Which of the following forces does ***positive*** work on the box?
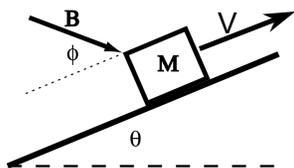
1) The external force B.

2) The normal force.

3) Friction.

4) Gravity.

5) None of the above.

6) Both the external and normal forces.

7) Both the external force and gravity.

8) Both the external force and friction.

9) Both friction and gravity.

10) All forces except the normal force.

A box is moving ***down*** an incline at a constant speed, V. The box has mass M. There is friction between the box and the incline and an external force of magnitude B and angle as shown acts on the box. Which of the following forces does ***negative*** work on the box?

1) The external force B.

2) The normal force.

3) Friction.

4) Gravity.

5) None of the above.

6) Both the external and normal forces.

7) Both the external force and gravity.

8) Both the external force and friction.

9) Both friction and gravity.

10) All forces except the normal force.