Work – Energy Theorem

**1**. Explain how (+) and (-) work applies to the work – energy theorem.

**2.** A 50.0 kg sled is sitting still on a flat snowy field. You grab the rope attached to the sled and pull with a constant 50.0 N force directed at 60.0o above horizontal for 20.0 meters. The force of friction acting on the sled is 20.0N.

a) How much work did you do pulling the sled?

b) How much work was done by friction?

c) What was the net work done on the sled?

d) What was the final Ek of the sled?

e) What is the final velocity of the sled?

**3.** Kenny (60.0kg) snowboards over the crest of a hill at 3.00m/s. He then goes straight down slope, a distance of 50.0m, and hits a tree, moving at 18.0m/s (that’s Kenny moving at 18m/s, not the tree), killing Kenny as a tree branch impales his head completely and emerges from the back of his skull with an eye ball dangling from it gruesomely. The force of friction acting on Kenny’s board was 75.0N. Calculate:

a) Kenny’s initial Ek at the top of the hill.

vi = 3.00 m/s

b) Kenny’s final Ek just before hitting the tree.

c) The net work done on Kenny (before he hits the tree).

d) The work done on Kenny by friction.

e) The work done on Kenny by gravity.

f) Find the height of the hill

d= 50m

θ

vf = 18.0m/s

g) Find θ.

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