Kinetic Energy Homework

1. Calvin and Hobbes are riding their sleigh down a hill. Calvin has a mass of 30 kg and Hobbes has a mass of 2 kg. Calculate the speed of the sleigh if it has a kinetic energy of 1600 J.
2. Calvin (mass 30 kg) is chasing Susie with a water balloon. He starts from rest and accelerates to a speed of 5 m/s. He chases her for 15 m before
   1. How much kinetic energy does Calvin have initially?
   2. How much kinetic energy does Calvin have while chasing Susie?
   3. Find the net force on Calvin (use Newton’s Second Law)
   4. Find the work done on Calvin
3. Hobbes (mass 2 kg) decides to “pounce” on Calvin. He is initially moving at a speed of 1.5 m/s. Find his final speed if he does 20 J of work getting up to “pouncing” speed.
4. What do you think will happen to the speed of an object if you do positive work on it? How about negative work? Justify your answer

Answers

1. 10 m/s
2. a.) 0 J

b.) 375 J

c.) 25 N

d.) 375 J

1. 4.21 m/s
2. Increase speed for positive work

Decrease speed for negative work

