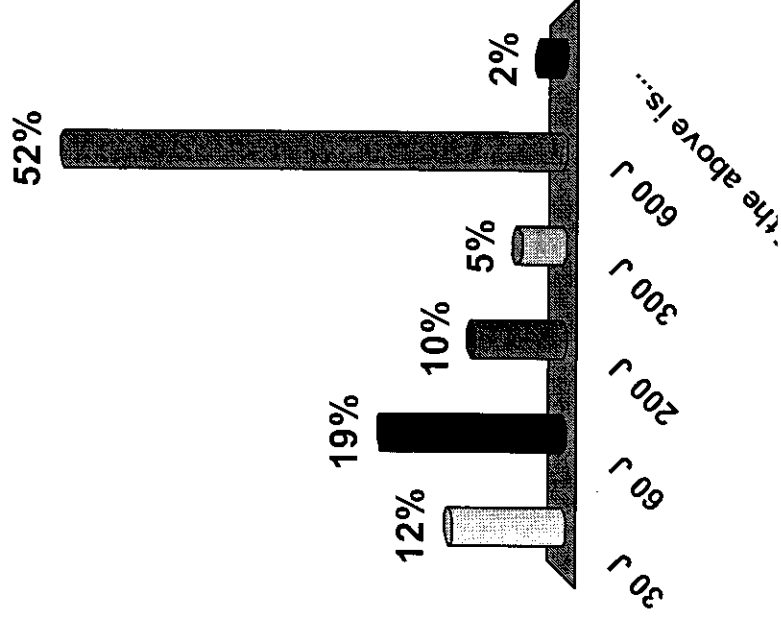


10/15/07 @

As an object falls freely near earth, work is done on it by the gravitational force of earth. If an object has a mass of 3 kg and falls 20 m. how much work is done by gravity?

- a) 30 J
- b) 60 J
- c) 200 J
- d) 300 J
- e) 600 J
- f) None of the above is within 10%.



The answer is e) 600 J; as follows,

- The work done is given, in general, by

$$W_G = F_G * d * \text{Cos}\theta_{F_d}$$

- For this object the displacement, d , is vertically downward, and so is the gravitational force. Therefore $\theta_{F_d} = 0$,
- and $\text{Cos}\theta_{F_d} = 1.0$. Also, $F_G = mg$.
- Thus $W_G = m * g * d = 3 * 10 * 20 \text{ kg-m/s}^2 = 600 \text{ J. (e)}$