

Solutions

2.1 B Define the system and useful output before calculating efficiency. Doubling speed quadruples kinetic energy at constant mass. Power describes transfer per time, not total energy.

2.2 Efficiency = $150/250 \times 100 = 60\%$.

2.3 False. Efficiency cannot exceed 100% for a properly defined energy balance. Energy dissipated by heating is still conserved.

2.4 power. power means Energy transferred per unit time.

3.1 Input power 125 W, useful power 75 W, efficiency 60%. The remaining 200 J goes to other transfers or stores. Define the task and system before calling energy useful.