Tuesday, January 7, 2020 8:21 AM

8. What happens to its kinetic, potential, and mechanical energy as it moves from D → E?

Mechanical: RTS Potential: ↓ (↓h) Kinetic: ↑ (↑v)

9. Calculate the speed of the cart at position E.

$h_E = 0$

$v_E = ?$

$KE_A^{0} + PE_A = KE_E + PE_E^{0}$

$mgh_A = \frac{1}{2}mv_E^2$

$(200kg)(9.81 m/s^2)(60m) = \frac{1}{2}(200kg)(v_E)^2 \rightarrow v_E = 34.3 m/s$

SAME AS v_C

11. What happens to its kinetic, potential, and mechanical energy as it moves from E → F?

Mechanical: RTS Potential: ↑ (↑h) Kinetic: ↓ (↓v)

12. Calculate the speed of the cart at position F.

$h_F = 30m$

$v_F = ?$

$KE_A^{0} + PE_A = KE_F + PE_F$

$mgh_A = \frac{1}{2}mv_F^2 + mgh_F$

$(9.81 m/s^2)(60m) = \frac{1}{2}(v_F)^2 + (9.81 m/s^2)(30m) \rightarrow v_F = 24.3 m/s$

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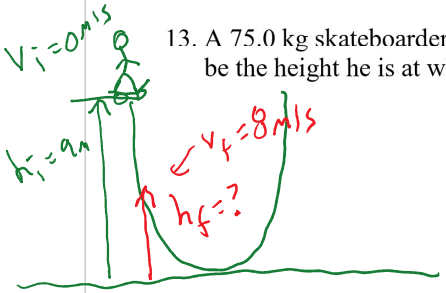
13. A 75.0 kg skateboarder starts at rest and goes down a half pipe that is 9.0 m tall. Ignoring friction, what would be the height he is at when he has a speed of 8.00 m/s down the ramp?



$m = 75kg$

$KE_i + PE_i = KE_f + PE_f$

$mgh_i = \frac{1}{2}mv_f^2 + mgh_f$

$(9.81 m/s^2)(9m) = \frac{1}{2}(8 m/s)^2 + (9.81 m/s^2)h_f$

$h_f = 5.74m$