



| | Kinetic $\frac{1}{2}mv^2$ | grav. pot. mgh | |
|---|--|------------------------|--------------------------|
| A | 0 | $(0.03)(9.8)(0.40)$ | .1176 |
| B | $\frac{1}{2}(0.03)v_B^2$ | 0 | .015 v_B^2 |
| C | $\frac{1}{2}(0.03)v_C^2$ | $(0.03)(9.8)(0.02679)$ | .015 $v_C^2 + .007876$ |
| D | $\frac{1}{2}(0.03)(v_C \cos 30^\circ)^2$ | $(0.03)(9.8)h_D$ | .01125 $v_C^2 + .294h_D$ |

$$A = B \quad .1176 = .015v_B^2 \Rightarrow v_B = 2.8 \text{ m/s}$$

$$A = C \quad .1176 = .015v_C^2 + .007876 \Rightarrow v_C = 2.7 \text{ m/s}$$

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$$N - W = ma = \frac{mv^2}{r}$$

$$N = mg + \frac{mv^2}{r} = (0.03)(9.8) + (0.03) \frac{(2.8)^2}{0.20}$$

$$= .294 + 1.176 = 1.47 \text{ N}$$

v_C

30°

$v_D = v_C \cos 30^\circ$

$x: v_C \cos 30^\circ$

↑ constant