So speed of block after collision is

$$v_2 = \boxed{47.1 \ \tfrac{m}{s} \quad \text{back up ramp}}$$

and

$$v_1 = v_B - \left(\tfrac{m}{M}\right)v_f - \left(\tfrac{m}{M}\right)v_2 = \underline{+7.2 \ \tfrac{m}{s} \ \text{towards ramp}}$$

Check: Thus

$$KE_{\text{after}} = \tfrac{1}{2}mv_2^2 + \tfrac{1}{2}Mv_1^2 = 2348 \text{ J}$$

$$KE_{\text{before}} = \tfrac{1}{2}mv_f^2 + \tfrac{1}{2}Mv_B^2 = 2347 \text{ J}$$

} close enough

Now block goes back up ramp.

$$KE_i + GPE_i = KE_f + GPE_f + W(\text{friction})$$

$$\tfrac{1}{2}mv_2^2 + 0 = \tfrac{1}{2}mv_f^2 + mgH + mgL\cos\theta\mu$$

$$2218 \text{ J} = \tfrac{1}{2}mv_f^2 + 134 \text{ J} + 36.8 \text{ J}$$

$$\tfrac{1}{2}mv_f^2 = 2048 \text{ J}$$

$$\rightarrow \boxed{v_f = 45.3 \ \tfrac{m}{s}} \text{ at top of ramp}$$