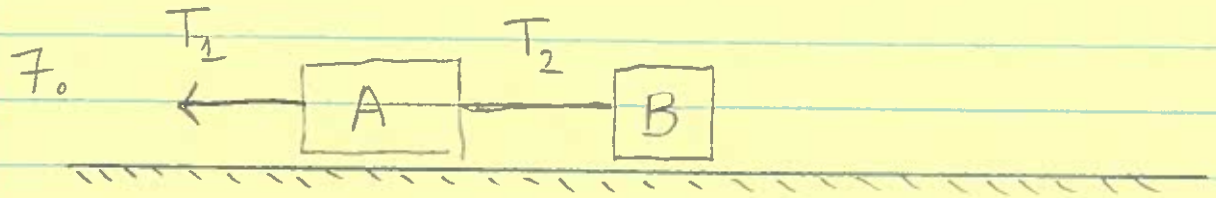


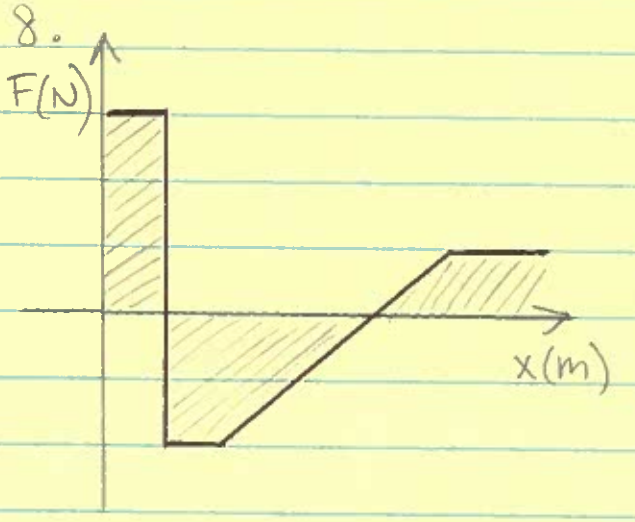
$$-T_1 + T_2 = -m_A a$$

We are told that box A accelerates to the left; hence, the net force on box A is to the left. Therefore,

$$|T_1| > |T_2|$$

Choice ① is correct.

8.



If one makes a graph showing the force exerted on an object as it moves, the area under the curve represents work done by the force on the object.

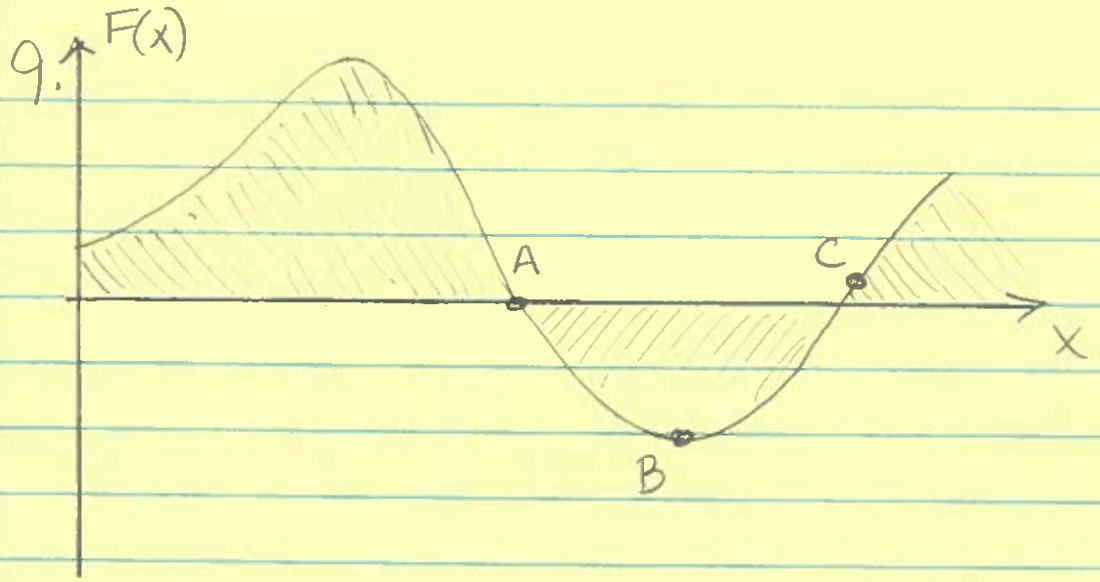
$$W = \int \vec{F} \cdot d\vec{x}$$

Choice ⑥ is correct.

and

$$W = KE_f - KE_i$$

9.



The graph shows the force acting on a crate of mass m that starts from rest at the origin and moves along the positive x-axis under the influence of this force.

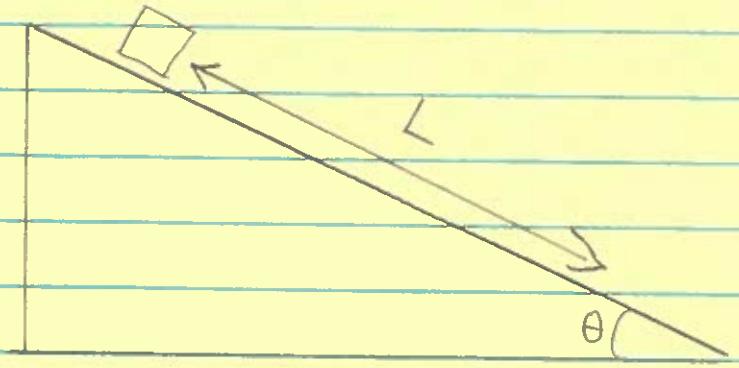
From start to A, work done is positive, so box speeds up by a lot. V_A = fast

From A to B, work done is negative, so box slows down. But area is smaller than that from origin to A, so box still has plenty of KE. V_B = medium

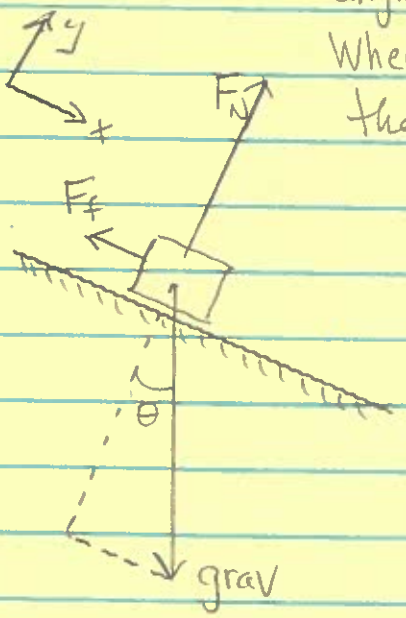
From B to C, work done is negative: negative area from B to C is larger than small positive component. Kinetic energy of the box decreases. V_C = slow

Choice (5) is correct. $KE_A > KE_B > KE_C$

10.



Box of mass m is at rest on ramp of angle θ. Coeff of kinetic fnction is μ_K. When released, box slides distance L down the ramp.



force	x	y
gravity	$mg\sin\theta$	$-mg\cos\theta$
normal	0	$+F_N$
friction	$-\mu_K F_N$	0
total	ma_x	$ma_y = 0$

Because $a_y = 0$, $F_N = mg\cos\theta$

Thus

$$|F_f| = \mu_K (mg\cos\theta)$$

Option (4) is correct.