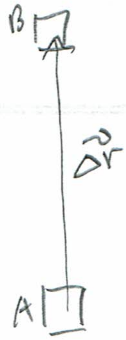
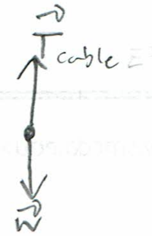
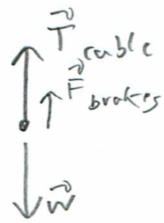
3.





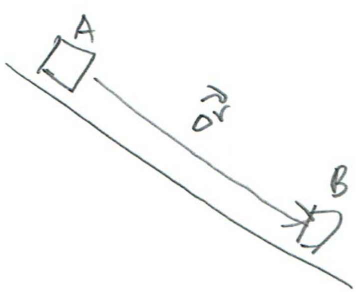
	Sign	
T_{cable}	+	
w	−	
W_{net}	0	
ΔK	0	← change in speed is zero

4.



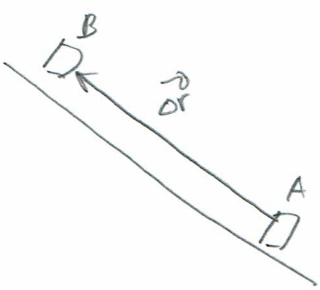
	Sign	
T_{cable}	−	
F_{brakes}	−	
w	+	
W_{net}	−	← slows down
ΔK	−	

5.



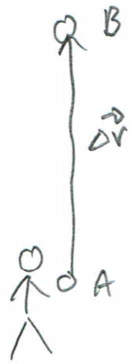
	Sign	
n	0	($\perp$ to motion)
w	+	
W_{net}	+	speeds up
ΔK	+	

6.



	Sign	
n	0	
w	−	
W_{net}	−	slows down
ΔK	−	

7.



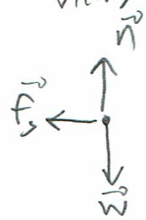
	Sign	
W	$-$	
W_{net}	$-$	slows down
ΔK	$-$	

8.

	Sign	
W	$-$	
$\vec{F}_{hand}$	$+$	
W_{net}	$+$	speeds up
ΔK	$+$	

9.

(from behind car view)

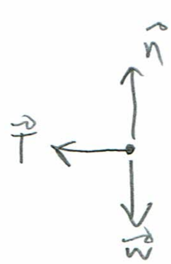


Assumes negligible drag and engine force

	Sign	
n	0	all $\perp$ to motion
f_s	0	
w	0	
W_{net}	0	no change in speed
ΔK	0	

↓ if present drag and the force caused by the engine would provide negative and positive work, respectively.

10.



(view from side)

	Sign	
T	0	all $\perp$ to motion
n	0	
w	0	
W_{net}	0	no change in speed
ΔK	0	

$\vec{\Delta r} = 0$ since there's no displacement

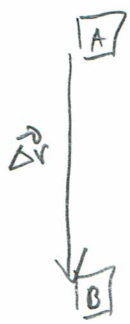
11. $W = Fd$ here (constant force in the same direction as $\Delta\vec{r}$)

F and d are the same for both, so W is the same

There fore ΔK is the same.

12. Particle A will travel further since its accel will be greater $\left(d = \frac{1}{2}at^2\right)$. Since $W = Fd$ that means more work will be done on A.

13.



$$W_{spring} = -\frac{1}{2}k\left(x_f^2 - x_i^2\right)$$

where $x_f = d$, $x_i = 0$ since x is distance from equilibrium

$$= -\frac{1}{2}kd^2$$

$$W_{grav} = mgd$$

let $d = |\Delta\vec{r}|$

$\Delta K = 0$ (starts and ends at rest

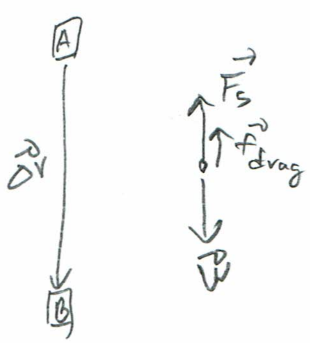
so $W_{net} = \Delta K = 0$

$$\Rightarrow -\frac{1}{2}kd^2 + mgd = 0$$

$$\Rightarrow \frac{1}{2}kd^2 = mgd$$

$$\Rightarrow d = \frac{2mg}{k} = 0.196\,m$$

14.



works are the same as above, but add $W_{drag} = -f_{drag} \cdot d$

So $W_{net} = \Delta K$

$$\Rightarrow -\frac{1}{2}kd^2 - f_{drag}d + mgd = 0$$

$$\Rightarrow \frac{1}{2}kd = mg - f_{drag}$$

$$\Rightarrow d = \frac{2(mg - f_{drag})}{k} = 0.166\,m$$