c) Suppose a, b, and c are integers. If a | b and b | c, then a | c.

True.

If $a|b$, then $\exists k \in \mathbb{Z}$ such that $ka = b$ ①

Also if $b|c$, then $\exists m \in \mathbb{Z}$ such that $mb = c$ ②

1 mark

Subbing ① into ② for b gives:

$$m(ka) = c$$

$$\Rightarrow (mk)a = c$$

1 mark

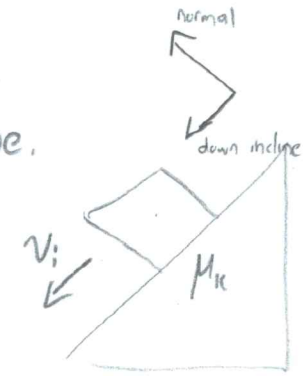
mk is an int, thus $a|c$.

1 mark

□

d) If an object's acceleration vector is pointing up a stationary incline, then it is moving up the incline.

False.



Suppose there is friction between the object and incline.

The block is given an intial speed down the incline.

The net force down the incline is given by the equation: $F_{net\ down\ incline} = ma_{down\ incline} = mg\sin\theta - f_{friction}$

$$\Rightarrow ma = mg\sin\theta - \mu_K mg\cos\theta$$

$$\Rightarrow a = g\sin\theta - \mu_K g\cos\theta$$

Suppose $\mu_K = 0.9$ & $\theta = 30°$. This makes $\vec{a}$ point in the negative direction (up the incline). So the hypothesis is satisfied. But the object is still moving down the incline, merely slowing down.