Q4

a) $60 \text{ km/h} \rightarrow 16.67 \text{ ms}^{-1}$

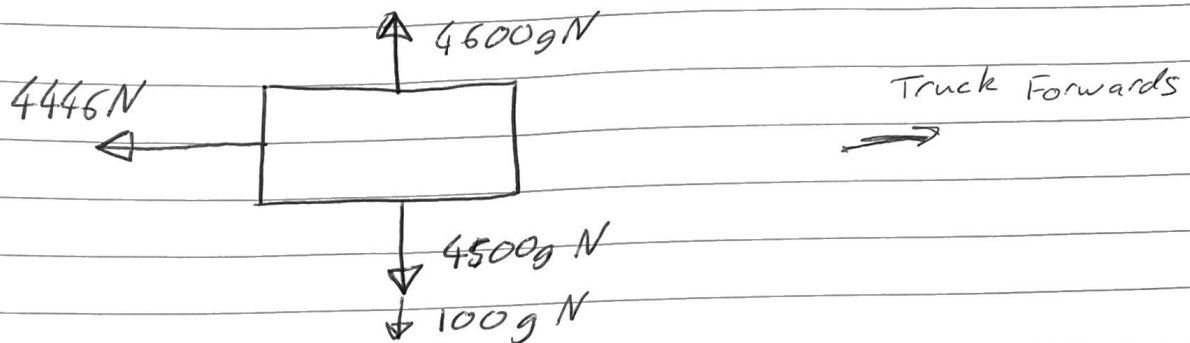
$D = 16 \times 16.67^2$

$= \cancel{2667} \text{ N}$

$= 4446.2224$

$= 4446 \text{ N}$

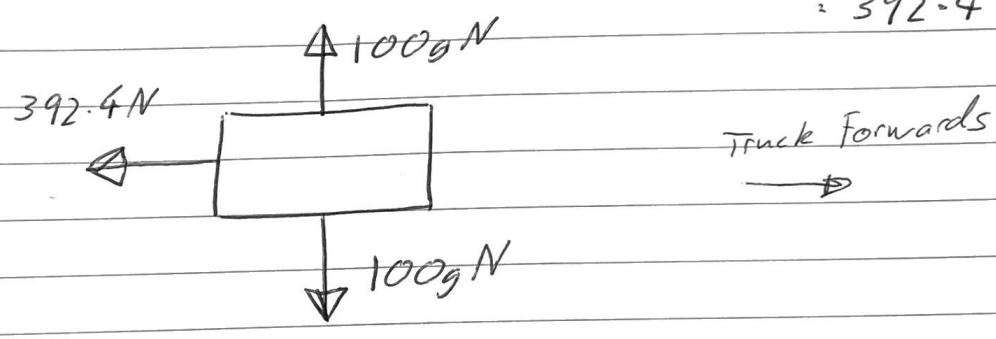
TRUCK:



b) CRATE:

$0.4 \times 100g$

$= 392.4$



c) $F = ma$

$\frac{392.4}{100} = 3.924 \text{ ms}^{-2}$

Maximum deceleration of 3.92 ms^{-2}

d) 392.4 ~~kg~~

392.4N → 100 kg

~~18050~~ ~~4600kg~~

18050.4N → 4600kg

Maximum braking force of 18.2kN

e) $F = ma$

$18050.4 = 4600 \times a$

$a = 3.924$

$s = ?$

$u = 16.67$

$v = 0$

$a = -3.924$

~~$v^2 + u^2 = 2as$~~

$v^2 = u^2 + 2as$

$$s = \frac{v^2 - u^2}{2a}$$

$$s = \frac{0 - (16.67)^2}{2(-3.924)}$$

$= 35.4\ m$