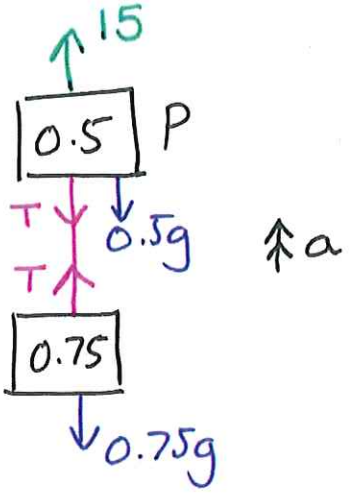
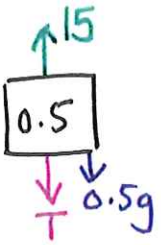
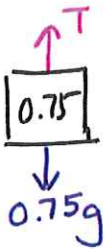
Q1.





$$F = ma$$

$$15 - T - 0.5g = 0.5a$$



$$F = ma$$

$$T - 0.75g = 0.75a$$

$$T = 0.75a + 0.75g$$

sub

$$15 - (0.75a + 0.75g) - 0.5g = 0.5a$$

$$15 - 0.75a - 0.75g - 0.5g = 0.5a$$

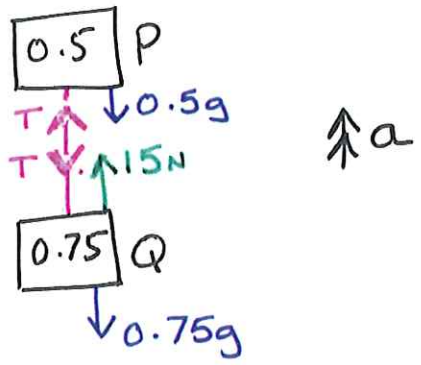
$$15 - 1.25g = 1.25a$$

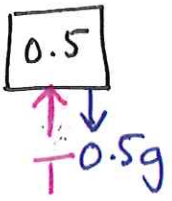
$$a = 2.2$$

$$T = 0.75(2.2) + 0.75g$$

$$T = \underline{9\ \text{N}}$$

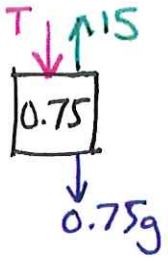
Q2.





$F = ma$

$T - 0.5g = 0.5a$



$F = ma$

$15 - T - 0.75g = 0.75a$

$T = 0.5a + 0.5g$

sub

$15 - (0.5a + 0.5g) - 0.75g = 0.75a$

$15 - 0.5a - 0.5g - 0.75g = 0.75a$

$15 - 1.25g = 1.25a$

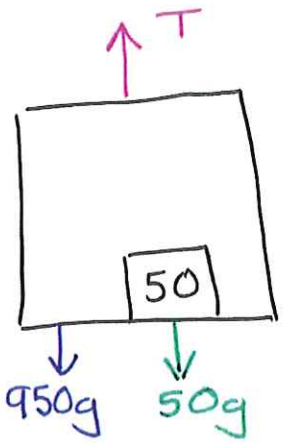
$2.75 = 1.25a$

$a = 2.2$

$T = 0.5(2.2) + 0.5(9.8)$

$T = \underline{6\text{ N}}$

Q3.



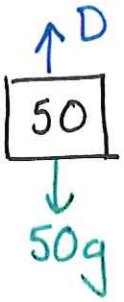
$\uparrow a = -2$

a) $F = ma$

$T - 1000g = 1000(-2)$

$T = \underline{\underline{7800\ N}}$

b)



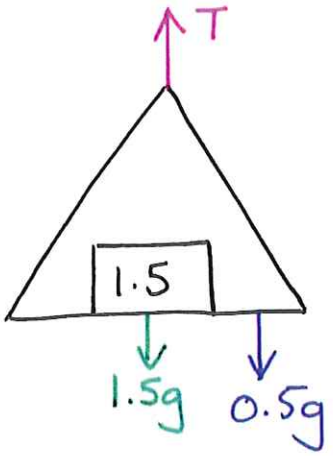
$F = ma$

$D - 50g = 50(-2)$

$D = 390$

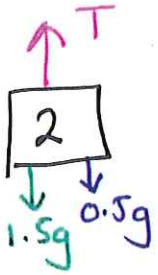
Force exerted on the women is 390 N

Q4.



↑ $a = 0.5$

a) overall



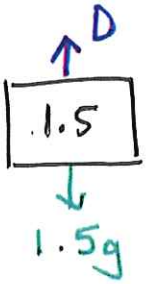
$F = ma$

$T - 2g = 2(0.5)$

$T = 1 + 2g$

$T = \underline{\underline{20.6\text{ N}}}$

b)



$F = ma$

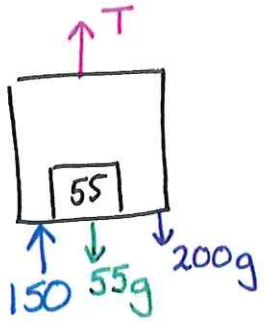
$D - 1.5g = 1.5(0.5)$

$D = 15.5$

Force exerted on scale pan is 15.5 N

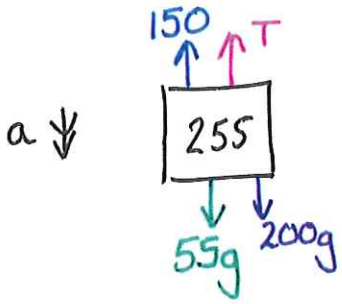
Q5.

a)



a

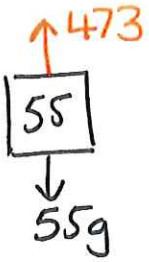
Overall



$F = ma$

$255g - 150 - T = 255a$

Crate



$F = ma$

$55g - 473 = 55a$

$a = 1.2\ ms^{-2}$

b)

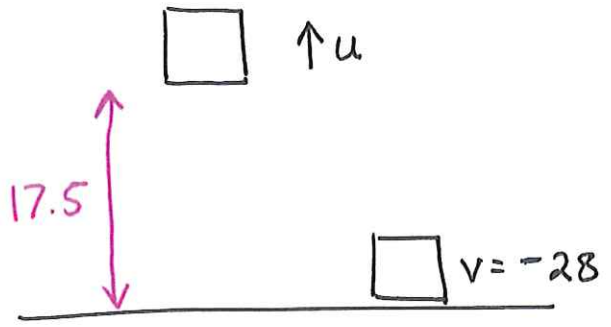


$255g - 150 - T = 255(1.2)$

$T = 2043N$

Force exerted on the lift is 2043

Q6.



a) $s = -17.5$

u

$v = -28$

$a = -9.8$

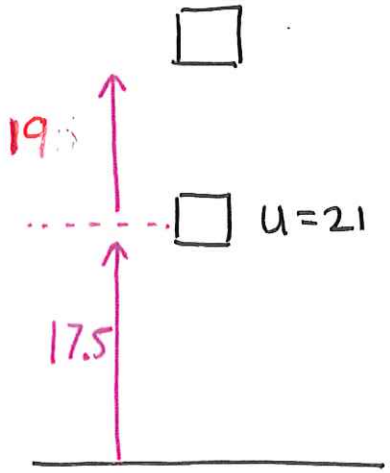
t

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

$(-28)^2 = u^2 + 2(-9.8)(-17.5)$

$u = 21$

b)



$s = 1.5$

$u = 21$

v

$a = -9.8$

t

$s = ut + \frac{1}{2}at^2$

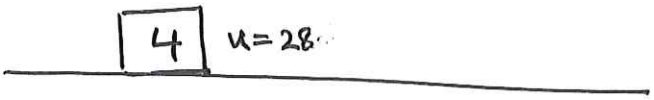
$19 = 21(t) + \frac{1}{2}(-9.8)t^2$

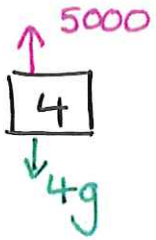
$0 = 4.9t^2 - 21t + 19$

$t = 2.99 \quad t = 1.3$

Q6.

C





$F = ma$

$4g - 5000 = 4a$

$a = -1240.2$

s

$u = -28$

$v = 0$

$a = -1240.2$

t

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

$0 = (-28)^2 + 2(-1240.2)s$

$s = \underline{\underline{0.316}}$