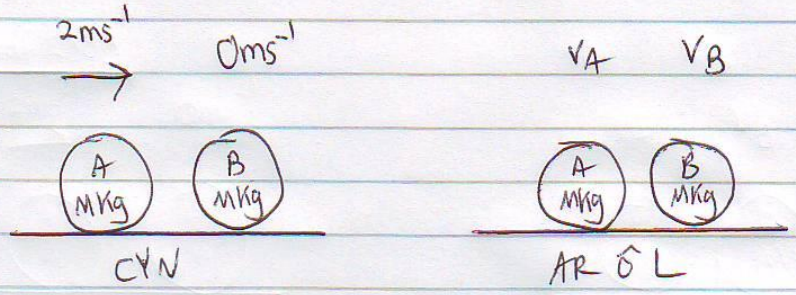
(1)



Egwyddor Cadwraeth Momentwm

$$M_A u_A + M_B u_B = M_A v_A + M_B v_B$$
$$2M + 0M = Mv_A + Mv_B$$
$$2 = v_A + v_B \quad \text{—(1)}$$

Deddf Adferiad Newton

$$v_B - v_A = -e(u_B - u_A)$$
$$v_B - v_A = -0.6(0 - 2)$$
$$v_B - v_A = 1.2$$
$$v_B = v_A + 1.2 \quad \text{—(2)}$$

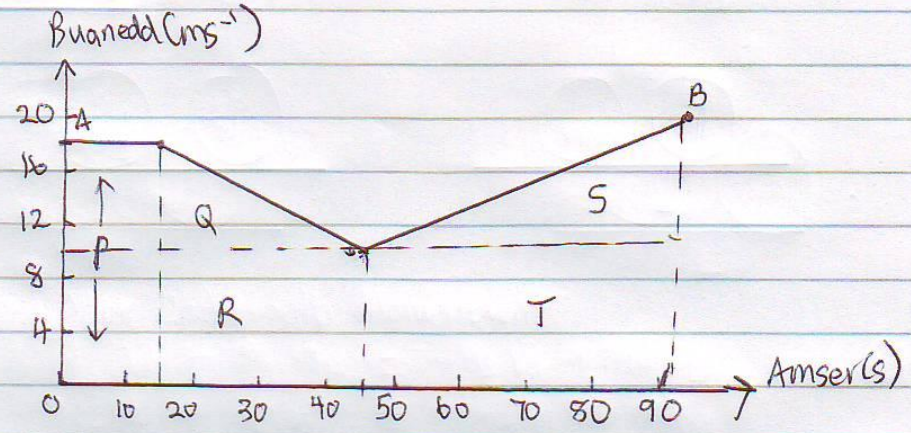
Amnewid (2) i (1)

$$2 = v_A + v_A + 1.2$$
$$2 = 2v_A + 1.2$$
$$0.8 = 2v_A$$
$$\underline{v_A = 0.4\ ms^{-1}}$$

Felly $v_B = v_A + 1.2$

$$v_B = 0.4 + 1.2$$
$$\underline{v_B = 1.6\ ms^{-1}}$$

(2) a)



b) $v = u + at$

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

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

$s = \left(\frac{u+v}{2}\right)t$

$s = ?$

$u = 10 ms^{-1}$

$v = 20 ms^{-1}$

$a = ?$

$t = 45s$

$v = u + at$

$20 = 10 + a \times 45$

$10 = 45a$

$a = \frac{10}{45}$

$a = \frac{2}{9} ms^{-2}$

c) Pellter o A i B = Arwynebedd o dan y graff

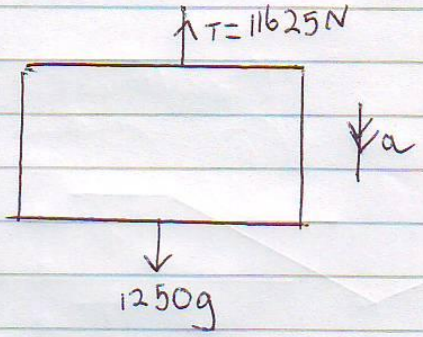
$= P + Q + R + S + T$

$= (15 \times 18) + (\frac{1}{2} \times 30 \times 8) + (30 \times 10)$

$+ (\frac{1}{2} \times 45 \times 10) + (45 \times 10)$

$= 1365 m$

(3)



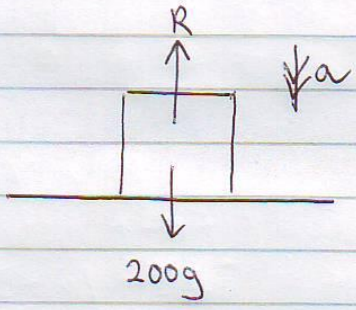
a) $F = ma$

$1250g - 11625 = 1250a$

$625 = 1250a$

$a = 0.5 ms^{-2}$

b)



$F = ma$ ar y crât

$200g - R = 200 \times 0.5$

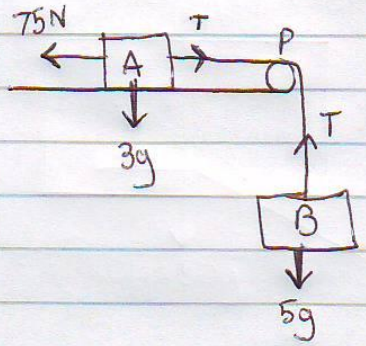
$200g - R = 100$

$-200g + R = -100$

$R = 200g - 100$

$R = 1860N$

(4)



F = ma ar A

$75 - T = 3a$ — (1)

F = ma ar B

$T - 5g = 5a$ ~~(2)~~

$T = 5g + 5a$ — (2)

Amnewid o (2) i (1)

$75 - (5g + 5a) = 3a$

$75 - 5g - 5a = 3a$

$75 - 5g = 8a$

$\frac{75 - 5g}{8} = a$

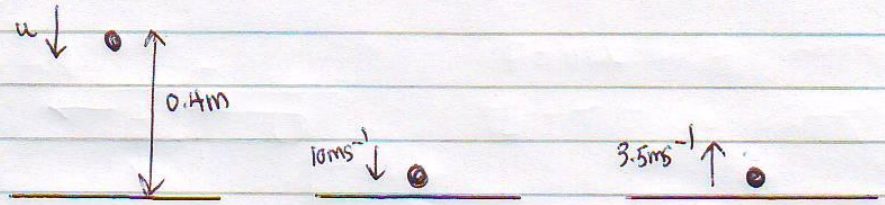
$a = 3.25\ ms^{-2}$

Felly $T = 5g + 5a$

$T = 5g + 5(3.25)$

$T = 65.25\ N$

(5)



(a) $s = 0.4m$
$u = u$
$v = 10ms^{-1}$
$a = 9.8ms^{-2}$
$t = ?$

$v^2 = u^2 + 2as$
$10^2 = u^2 + 2 \times 9.8 \times 0.4$
$100 = u^2 + 7.84$
$92.16 = u^2$
$u = 9.6ms^{-1}$

(b) $v = -eu$
$-3.5 = -e \times 10$
$\frac{-3.5}{-10} = e$
$e = 0.35$

(ch) $s = ?$
$u = -3.5ms^{-1}$
$v = ?$
$a = 9.8ms^{-2}$
$t = ?$

(c) Ergyd $= m(v-u)$
$= 0.7(-3.5 - 10)$
$= -9.45\ Ns$

Maint yr ergyd yw 9.45 Ns
Cyfeiriad yr ergyd yw i fyny.

ch) $s = ?$
$u = -3.5 ms^{-1}$
$v = ?$
$a = 9.8 ms^{-2}$
$t = 0.5s$

$v = u + at$
$v = -3.5 + 9.8 \times 0.5$
$v = 1.4 ms^{-1}$

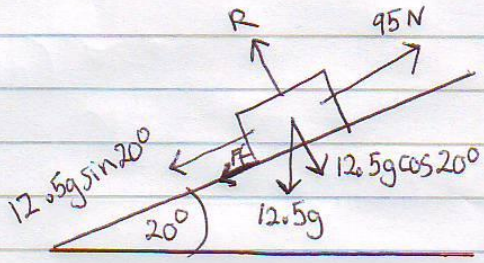
Buanedd y bêl yw $1.4 ms^{-1}$
Cyfeiriad mudiant: Ar ei lawr

d) $s = 0m$
$u = -3.5 ms^{-1}$
$v = ?$
$a = 9.8 ms^{-2}$
$t = ?$

$s = ut + \frac{1}{2}at^2$
$0 = -3.5t + \frac{1}{2} \times 9.8 \times t^2$
$0 = -3.5t + 4.9t^2$
$0 = t(-3.5 + 4.9t)$
Unai $t = 0s$ neu $-3.5 + 4.9t = 0$
$4.9t = 3.5$
$t = \frac{5}{7}s$

Yr amser rhwng y ddau adlamiad yw $\frac{5}{7}s$.

(6)



$\mu = 0.4$

(a) $F_{frictiant} = \mu R$

$R = 12.5g \cos 20°$

$R = 115.112346\ N$

Felly $F_{frictiant} = 0.4 \times 115.112346$

$= 46.04493842\ N$

(b) $F = ma$, yn baralel i'r plân

$95 -$ cydran o'r pwysau i lawr y plân $- F_{frictiant} = 12.5a$

$95 - 12.5g \sin 20° - 46.04493842 = 12.5a$

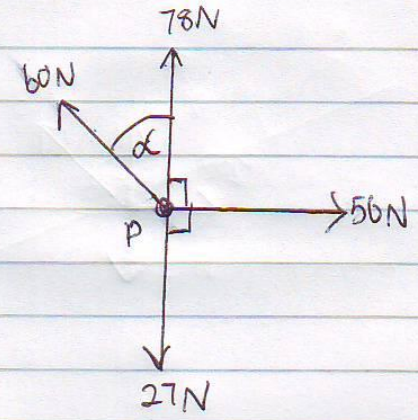
$7.057594023 = 12.5a$

$a = 0.564607521 8$

$a = 0.56\ ms^{-2}$

i 2 le degol,

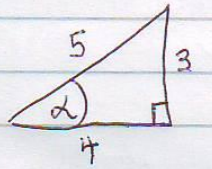
(7)

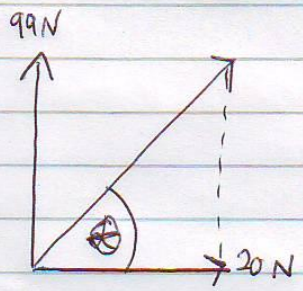


Grymoedd fertigol:
$78 + 60\cos\alpha - 27$
$78 + 60\left(\frac{4}{5}\right) - 27$
$= 99N$

Grymoedd llorweddol:
$56 - 60\sin\alpha$
$= 56 - 60\left(\frac{3}{5}\right)$
$= 20N$

$\tan\alpha = \frac{3}{4}$

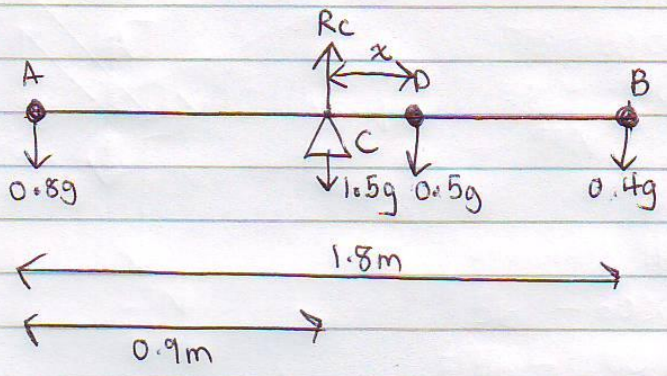




Maint y grym cydeffaith
$\sqrt{99^2 + 20^2}$
$= 101N$

Cyfeiriad y grym cydeffaith
$\tan\theta = \frac{99}{20}$
$\theta = \tan^{-1}\left(\frac{99}{20}\right)$
$\theta = 78.58°$
i 2 le degol

(8)



(a) Grymoedd i fyny = Grymoedd i lawr

$R_C = 0.8g + 1.5g + 0.5g + 0.4g$

$R_C = 31.36\ N$

(b) Momentau o gwmpas C

Momentau clocwedd = Momentau gwrthglocwedd

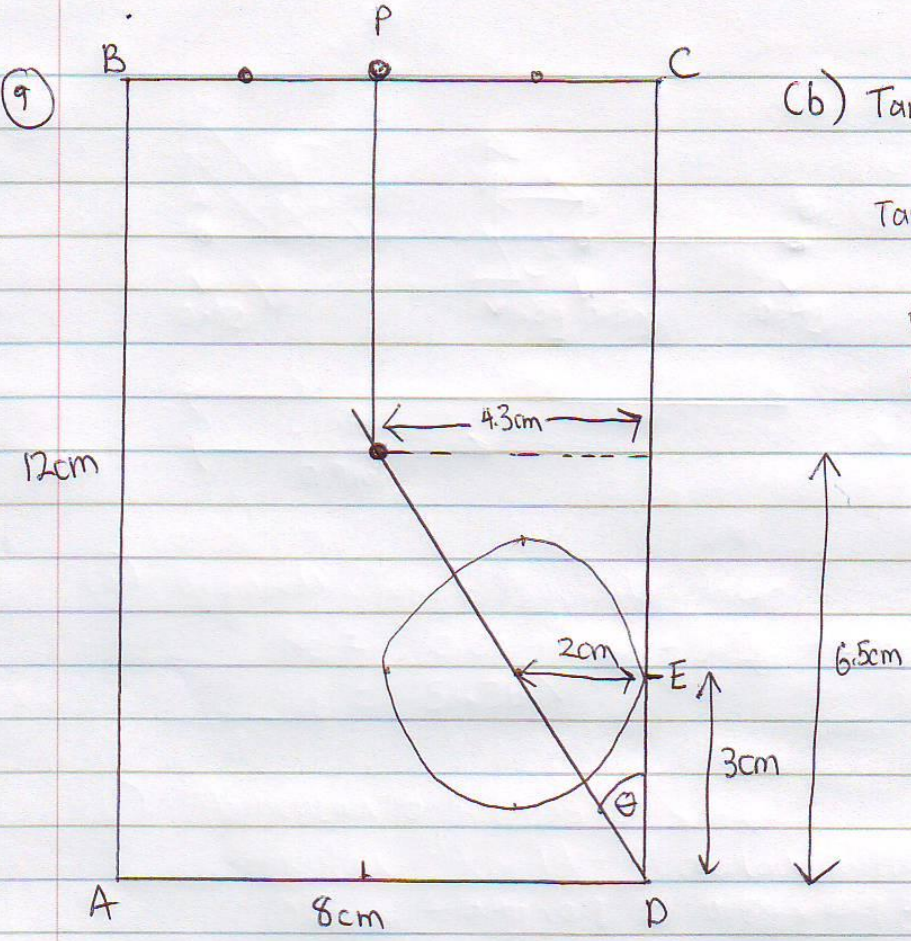
$0.5gx + 0.4g \times 0.9 = 0.8g \times 0.9$

$0.5x + 0.4 \times 0.9 = 0.8 \times 0.9$

$x = \dfrac{0.8 \times 0.9 - 0.4 \times 0.9}{0.5}$

$x = 0.72\ m$ (y pellter CD)

(9)



(b) $\tan\theta = \frac{\text{cyferbyn}}{\text{agos}}$

$\tan\theta = \frac{4.3}{6.5}$

$\theta = \tan^{-1}\left(\frac{4.3}{6.5}\right)$

$\theta = 33.5^\circ$

i un lle degol

(c) 3.7cm

(a)

Siâp	Arwynebedd	Pellter y craidd màs o AB	Pellter y craidd màs o AD
Petryal	96cm^2	4cm	6cm
Cylch	$4\pi\ \text{cm}^2$	6cm	3cm
Lamina	$96-4\pi\ \text{cm}^2$	$\bar{x}$	$\bar{y}$

Cymryd momentau o amgylch AB

$96\times 4 - 4\pi\times 6 = (96-4\pi)\bar{x}$

$\frac{96\times 4 - 4\pi\times 6}{96-4\pi} = \bar{x}$

$\bar{x} = 3.7\text{cm}$,

i un lle degol.

Cymryd momentau o amgylch AD

$96\times 6 - 4\pi\times 3 = (96-4\pi)\bar{y}$

$\frac{96\times 6 - 4\pi\times 3}{96-4\pi} = \bar{y}$

$\bar{y} = 6.5\text{cm}$,

i un lle degol