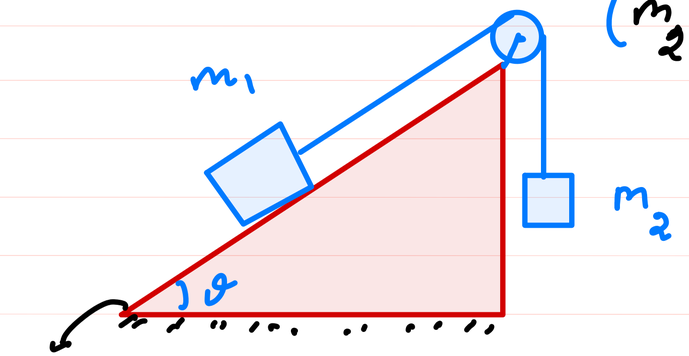
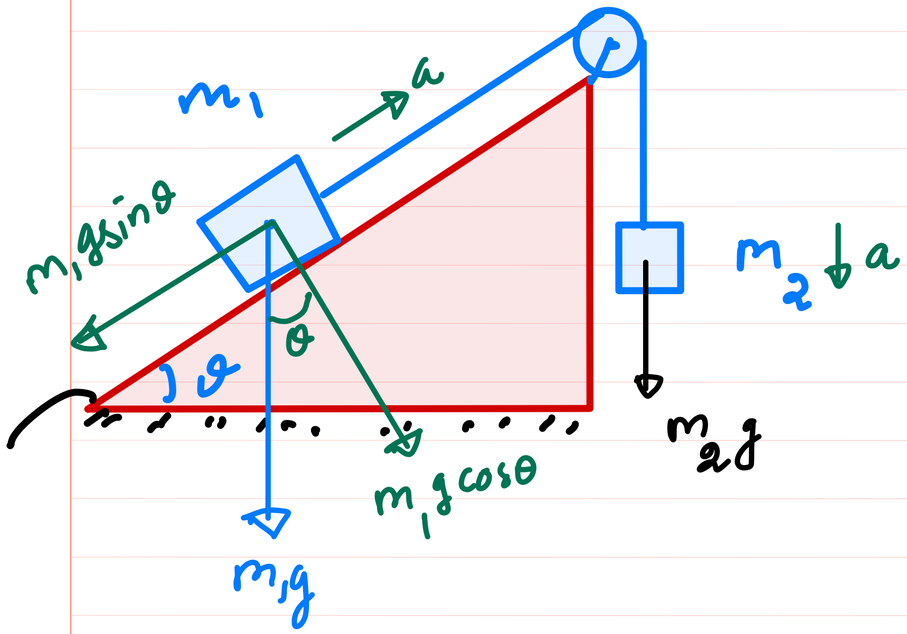
Ex $(m_2 > m_1)$ Find acc of blocks and Tension in string.



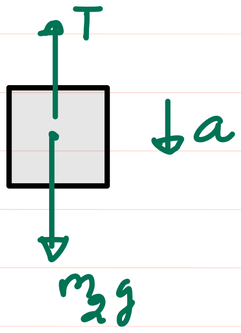
$$a = \frac{m_2 g - m_1 g \sin\theta}{m_1 + m_2}$$

$m_2 g - m_2 a = T$

$$T = \frac{m_2 m_1}{m_1 + m_2}(1 + \sin\theta) g$$

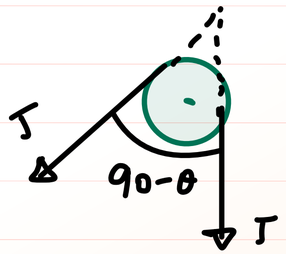


F. B. D of m_2



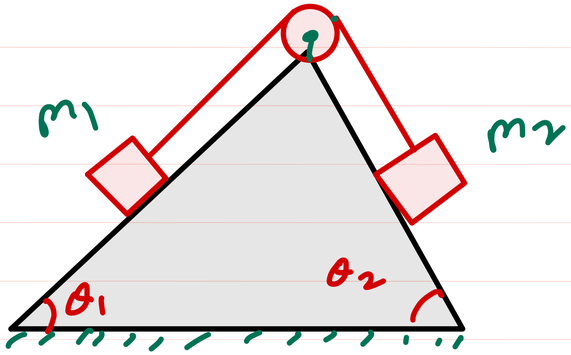
$m_2 g - T = m_2 a$

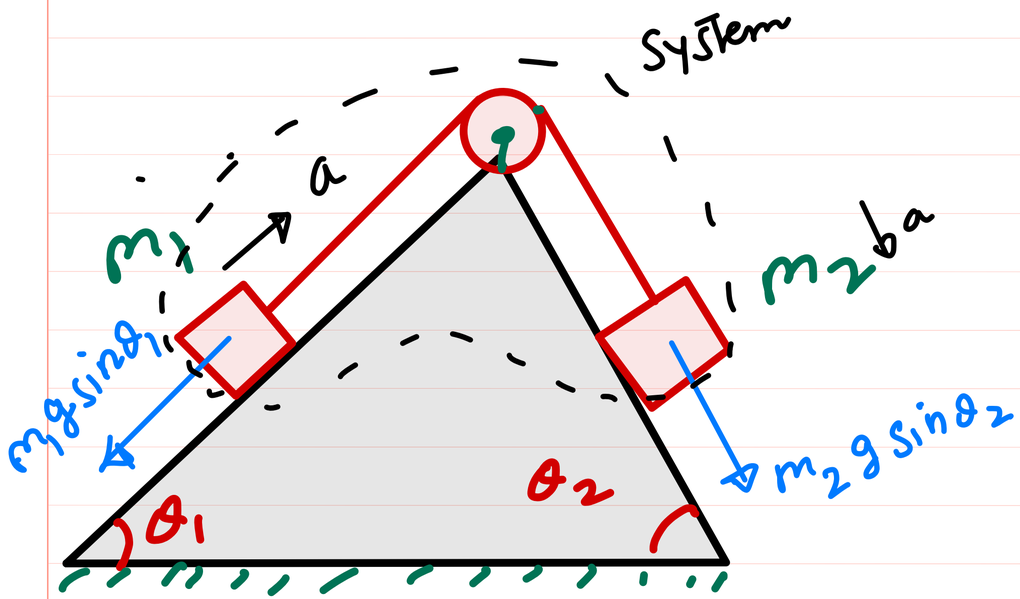
Net force on pulley



$F_{net} = 2T \cos\left(\frac{90-\theta}{2}\right)$

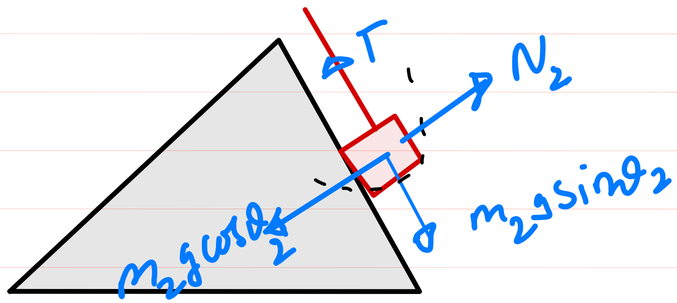
Ex $m_2 > m_1$ Find Acc. of blocks and Tension in string





$$a = \frac{m_2 g \sin\theta_2 - m_1 g \sin\theta_1}{m_1 + m_2}$$

F.B.D of m_2



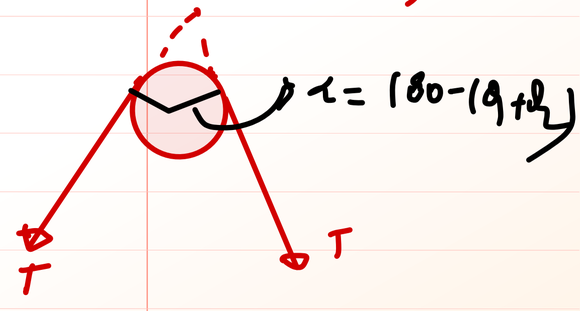
$m_2 g \sin\theta_2 - T = m_2 a$

$T = m_2 (g \sin\theta_2 - a)$

Put a and solving

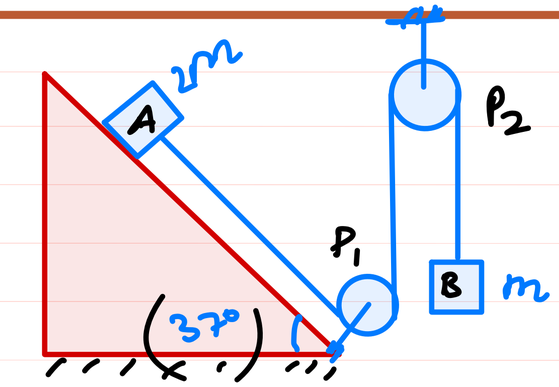
$$T = \frac{m_1 m_2 (\sin\theta_1 + \sin\theta_2) g}{m_1 + m_2}$$

Net force on Pulley

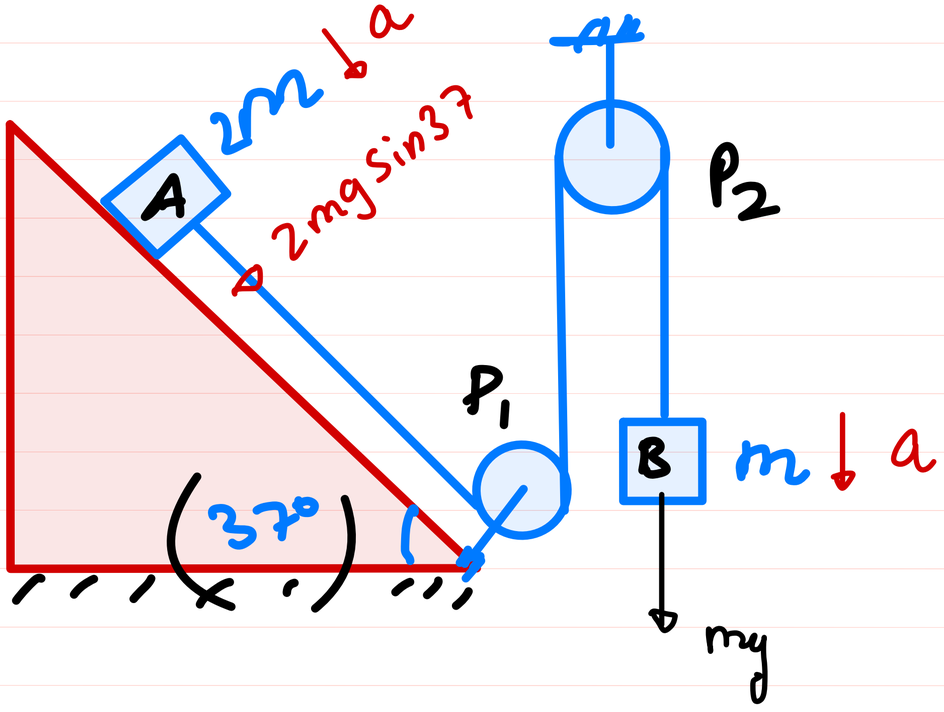


$F_{net} = 2T \cos(\alpha/2)$

Ex =



Find (i) Acc. of blocks
(ii) Tension in string
(iii) Net force on P_1 and P_2



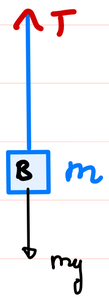
$$a = \frac{mg + 2mg\sin 37}{m + 2m}$$

$$= \frac{mg\left(1 + 2\times\frac{3}{5}\right)}{3m}$$

$$a = \frac{g}{3}\times\frac{11}{5}$$

$$\boxed{a = \frac{11g}{15}}$$ Ans =

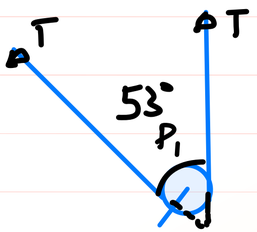
F.B.D of B



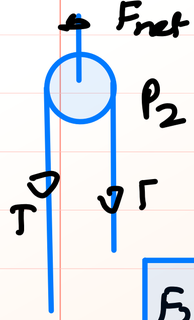
$$mg - T = ma$$

$$T = mg - m\times\frac{11g}{15}$$

$$\boxed{T = \frac{4mg}{15}}$$



$$\boxed{F_1 = 2T\cos\left(\frac{53}{2}\right)}$$

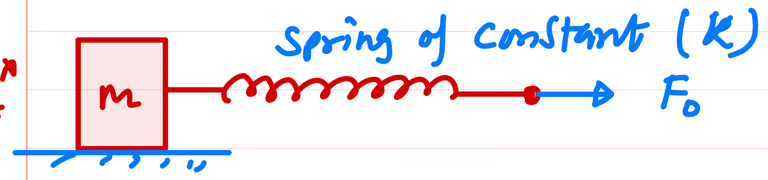


$$F_2 = 2T\cos\left(\frac{\theta}{2}\right)$$

$$\boxed{F_2 = \sqrt{2}T}$$

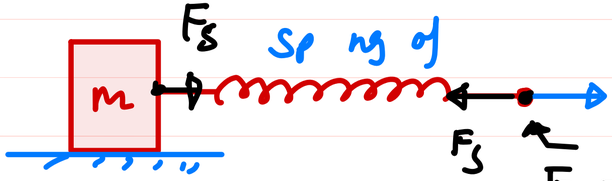
When Bodies are connected via spring and passing through pullies :→

Ex =



Find (i) Acc. of block

(ii) Elongation in spring



For block

$F_s = ma$

$F_0 = ma$

$a = \frac{F_0}{m}$ Ans

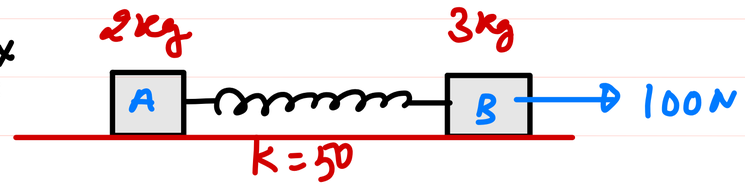
$F_0 - F_s = 0 \cdot a$

$F_0 = F_s$

$F_0 = Kx$

$x = \frac{F_0}{K}$ Ans

Ex =

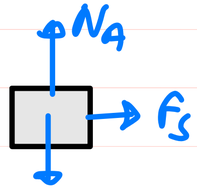


Find Acc. of blocks and maximum elongation in spring

(i)

$$a = \frac{100}{2+3} = 20\ m/s^2$$

(ii) F.B.D of 2kg



$F_s = ma$

$= 2 \times 20$

$F_s = 40\ N$

$Kx = 40$

$50x = 40$

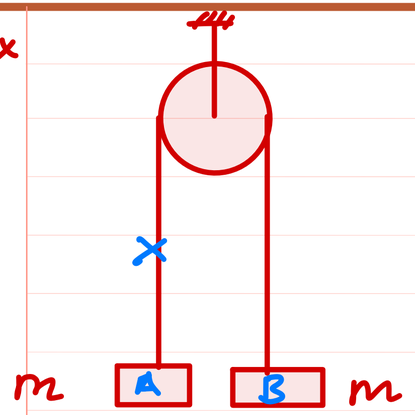
$x = \frac{40}{50}$

$= 0.8m$

$x = 80\ cm$

Concept :→ Spring Force Zero Nahi hota hai as we cut The String

Ex =

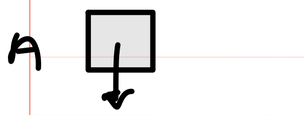


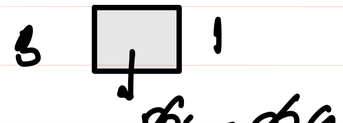
After cutting a string

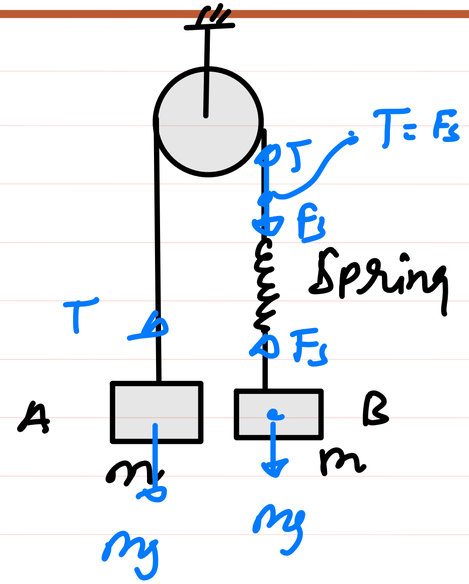
acc. of blocks

As we cut a string

Tension becomes zero







① Spring Force

② Elongation

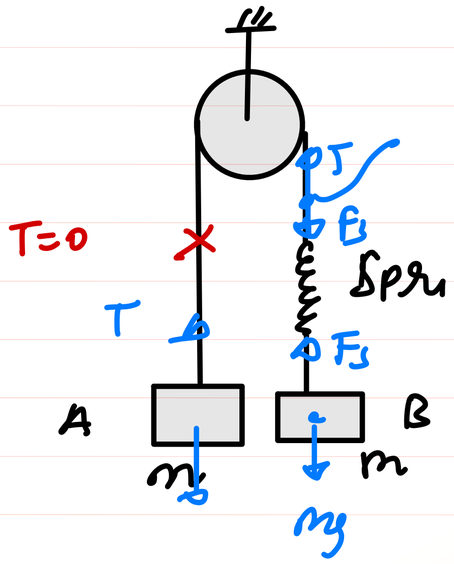
③ After cutting string in left Part acceleration of blocks

Sol

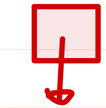
(i) $F_s = mg$

(ii) $Kx = mg$

$x = \frac{mg}{K}$



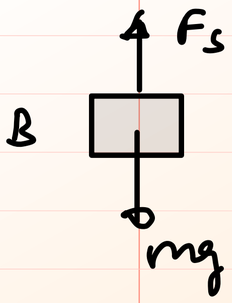
FOR A



$mg = ma$

$a_A = g$ downward

FOR B



$mg - F_s = ma_B$

$mg - mg = ma_B$

$a_B = 0$

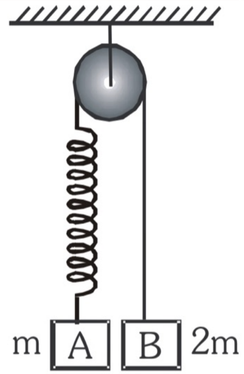
6. Two blocks A and B of masses m & 2m respectively are held at rest such that the spring is in natural length. What is the acceleration of both the blocks just after release?

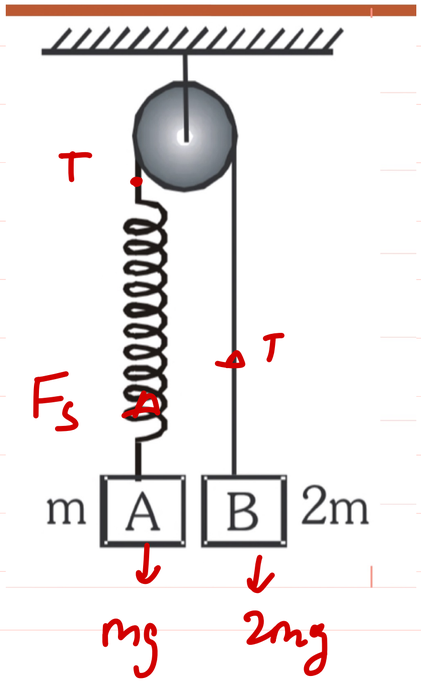
(A) g ↓, g ↓

(B) $\frac{g}{3}$ ↓, $\frac{g}{3}$ ↑

(C) 0, 0

(D) g ↓ , 0





$T = F_s = 0$

FOR - A

$mg - F_s = ma_A$

$a_A = g$

FOR - B

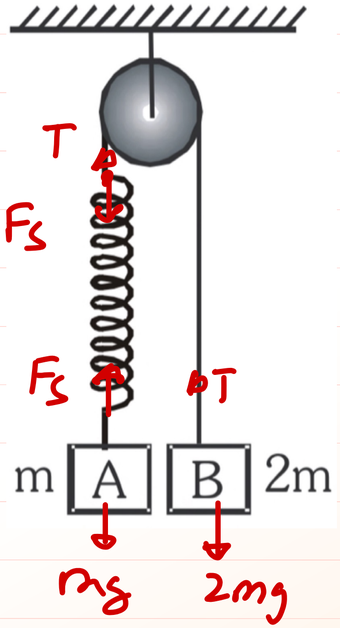
$2mg - T = 2ma_B$

$2mg = 2ma_B$

$a_B = g$

Ex

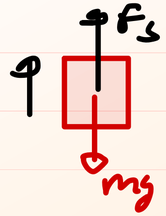
Does not cut the string Find Acc. of blocks and spring force



$a = \frac{2mg - mg}{m + 2m}$

$a = \frac{g}{3}$ Ans

FOR - A



$F_s - mg = m\frac{g}{3}$

$F_s = \frac{4mg}{3}$ Ans