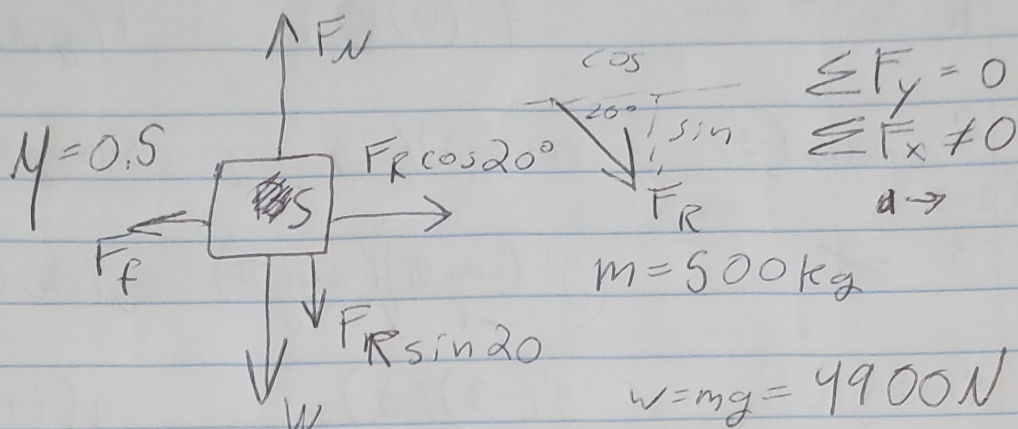


1.



$$x_f = \frac{1}{2} a t^2 + v_i t + x_i$$

$$F_N = 4900 + F_R \sin 20$$

$$F_f = 0.5 \cdot F_N = (F_R \cos 20) ?$$

$$100 = \frac{1}{2} a 64 + 0 + 0 \rightarrow a = 100/32 = 3.125 \text{ m/s}^2$$

$$F = ma \rightarrow 500 \cdot 3.125 = 1562.5 \text{ N}$$

$$\Sigma F_x = 1562.5 = \frac{2(F_R \cos 20)(4900 + F_R \sin 20)}{2}$$

$$3125 = 2F_R \cos 20 - 4900 + F_R \sin 20$$

$+4900$                        $+4900$

$$8025 = 2F_R \cos 20 + F_R \sin 20$$

$$5219.97 \quad \Sigma F_x = F_R \cos 20 - 0.5 F_N = 1562.5$$

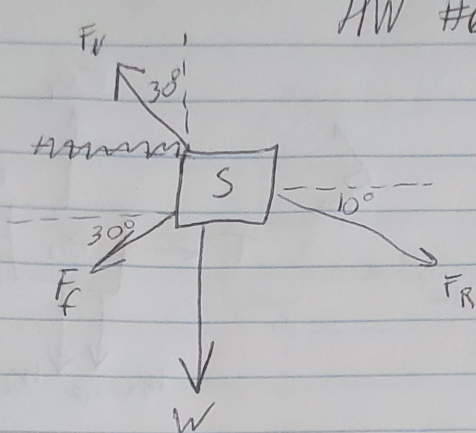
In calculator:  $x \cos 20 - \frac{(4900 + x \sin 20)}{2}$

root: 5219.97

$$F_R = 5219.97 \text{ N}$$

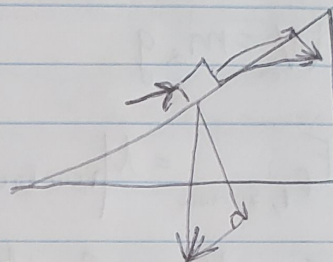
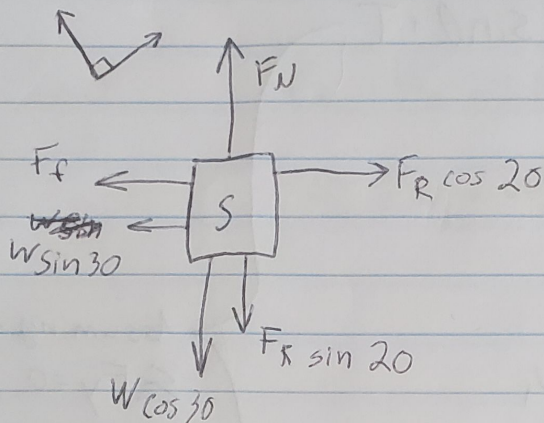
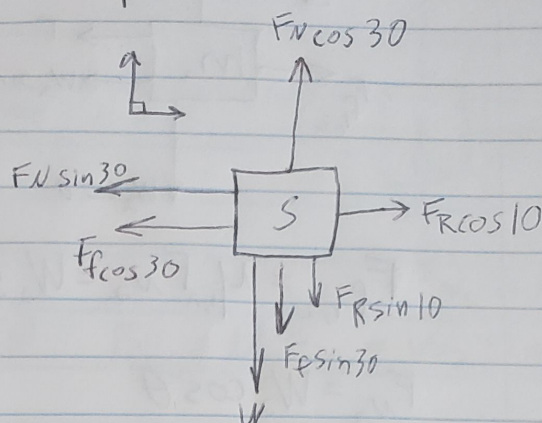


2.



$$\mu = 0.5$$

$$V_i = 10 \text{ m/s}$$



$$W = 4900 \text{ N}$$

$$F_N = W \cos 30 + F_R \sin 20$$

$$F_f = 0.5 F_N$$

$$\sum F_x = F_R \cos 20 - F_f - W \sin 30$$

$$\sum F_x = F_R \cos 20 - (0.5(W \cos 30 + F_R \sin 20)) - W \sin 30$$

$$5219.97 \cos 20 - (0.5(4243.52 + 5219.97 \sin 20)) - 2450$$

$$5219.97 \cos 20 - 3014.43 - 2450$$

$$4905.17 - 3014.43 - 2450$$

$$-559.26 \text{ N} \rightarrow a = \frac{F}{m} = \frac{-559.26}{500} = -1.12$$

$$a = \frac{\Delta v}{t}$$

$$V_f = V_i + at$$

$$V_f = 10 - 1.12t$$

$$x_f = \frac{1}{2} at^2 + V_i t + x_i \quad 20 = \frac{1}{2}(-1.12)t^2 + 10t + 0$$

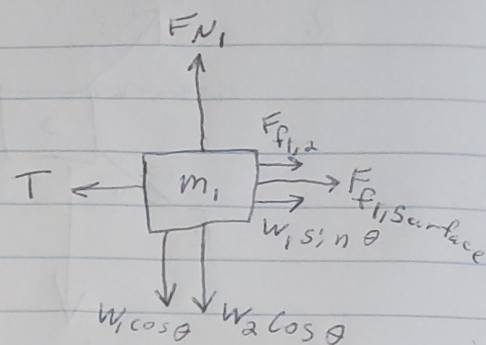
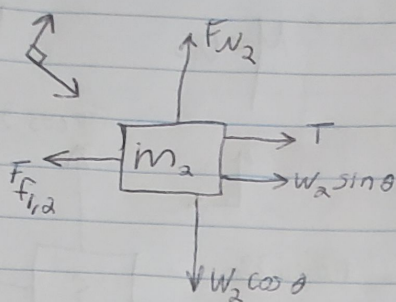
$$\text{calculator: } -0.56x^2 + 10x - 20 = y$$

$$\text{roots: } (2.29) \text{ and } 15.56$$

$$V_f = 7.43 \text{ m/s}$$



3.



$$F_{f,2} = \mu_{1,2} F_{N,2} = W_2 \sin \theta + T$$

$$F_{N,2} = W_2 \cos \theta$$

$$W_2 = m_2 g$$

$$F_{f,1,surface} = \mu_{1,surface} F_{N,1}$$

$$F_{N,1} = W_1 \cos \theta + W_2 \cos \theta$$

$$W_1 = m_1 g$$

$$T = F_{f,2} + F_{f,1,surface} + W_1 \sin \theta$$

Assuming:

$$\sum F_y = 0$$

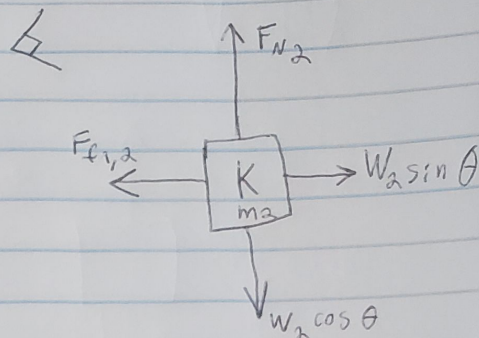
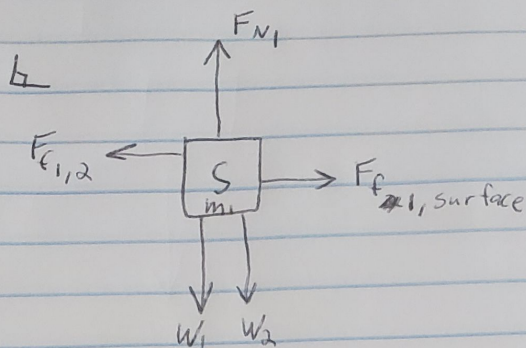
$$\sum F_x = 0$$



8, 64, 1  
64, 64, 8  
32, 61, 19

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4.



$$\sum F_x = 0$$
$$\sum F_y = 0$$

$$F_{N2} = W_2 \cos \theta$$

$$F_{f1,2} = \mu F_{N2} = W_2 \sin \theta$$

$$F_{N1} = W_1 + W_2$$

$$W_1 = m_1 g \quad W_2 = m_2 g$$

$$\mu F_{N1} = F_{f1, \text{surface}}$$

		customers				RAM				processors			
		Doug	Enrique	Jack	Nathaniel	1 GB	3 GB	4 GB	8 GB	1.4 GHz	1.6 GHz	2.4 GHz	3.8 GHz
hard drives	128 GB	X	X	X	O	X	X	O	X	X	O	X	X
	256 GB	O	X	X	X	O	X	X	X	X	X	O	X
	384 GB	X	O	X	X	X	O	X	X	X	X	X	O
	512 GB	X	X	O	X	X	X	X	O	O	X	X	X
processors	1.4 GHz	X	X	O	X	O	X	X	X				
	1.6 GHz	X	X	X	O	X	X	O	X				
	2.4 GHz	O	X	X	X	X	X	X	O				
	3.8 GHz	X	O	X	X	X	O	X	X				
RAM	1 GB	O	X	X	X								
	3 GB	X	O	X	X								
	4 GB	X	X	X	O								
	8 GB	X	X	O	X								