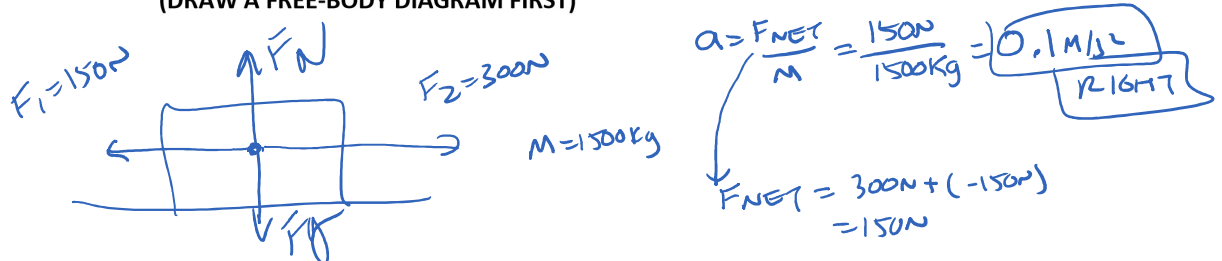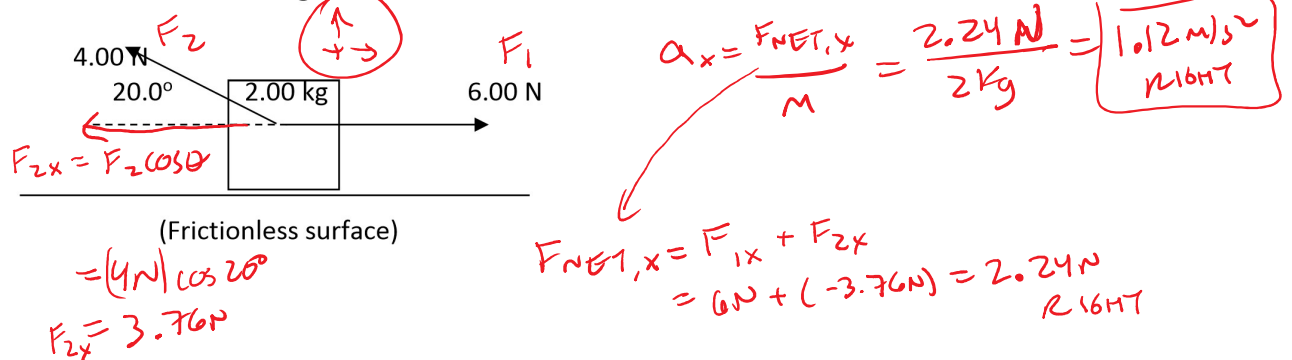11. A 1500 kg car is pulled to the left with a force of 150. N and to the right with a force of 300. N to the right. Calculate the magnitude and direction of the acceleration of the car?
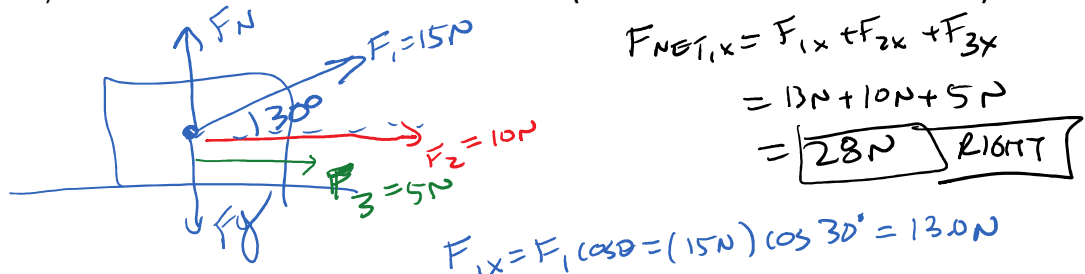**(DRAW A FREE-BODY DIAGRAM FIRST)**

$F_1 = 150N$ $\uparrow F_N$ $F_2 = 300N$

$M = 1500 kg$

$a = \dfrac{F_{NET}}{M} = \dfrac{150N}{1500 kg} = \boxed{0.1 M/s^2 \quad RIGHT}$

$F_{NET} = 300N + (-150N)$
$= 150N$

12. Find the magnitude and direction of the acceleration of the box.

4.00 N F_2 $\overset{\uparrow}{+\to}$ F_1

20.0°   2.00 kg   6.00 N

$F_{2x} = F_2 \cos\theta$

(Frictionless surface)

$= (4N) \cos 20°$
$F_{2x} = 3.76N$

$a_x = \dfrac{F_{NET,x}}{M} = \dfrac{2.24N}{2 kg} = \boxed{1.12 M/s^2 \quad RIGHT}$

$F_{NET,x} = F_{1x} + F_{2x}$
$= 6N + (-3.76N) = 2.24N \quad RIGHT$

13. A 50.0 kg block it pulled by three forces. Force 1 pulls with 15.0 N at an angle of 30.0 degrees to the right, Force 2 pulls with a 10.0 N force directly to the right, and Force 3 pulls with a force of 5.00 N directly to the right.

A) Find the net horizontal force on the block. **(DRAW A FREE-BODY DIAGRAM FIRST)**

$\uparrow F_N$ $F_1 = 15N$ $30°$ $F_2 = 10N$ $F_3 = 5N$ $\downarrow F_g$

$F_{NET,x} = F_{1x} + F_{2x} + F_{3x}$
$= 13N + 10N + 5N$
$= \boxed{28N \quad RIGHT}$

$F_{1x} = F_1 \cos\theta = (15N) \cos 30° = 13.0N$

B) Find the acceleration of the block.

$a_x = \dfrac{F_{NET,x}}{m} = \dfrac{28N}{50 kg} = \boxed{0.56 M/s^2 \quad RIGHT}$

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