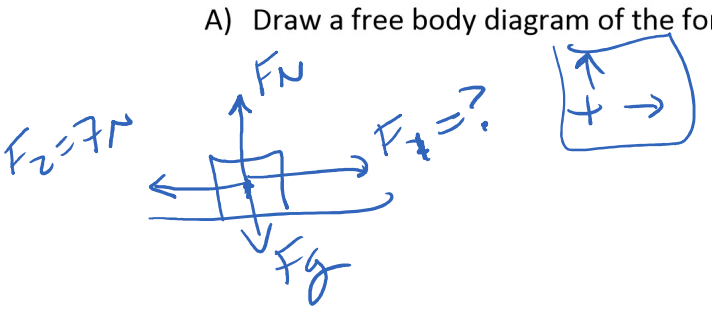
Thursday, November 01, 2018 8:08 AM

8. A 7.00 N force acts to the left on a 1.50 kg box while an unknown force acts to the right while on top of a flat surface. The box accelerates to the right at 3.33 m/s^2.

A) Draw a free body diagram of the forces acting on the box.



M=1.50Kg
a=3.33m/s^2

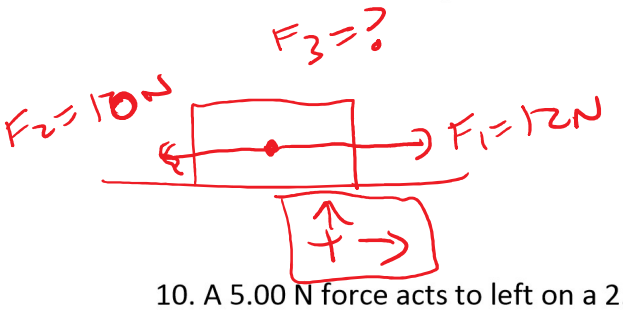
B) Determine the magnitude of the unknown force acting to the right on the box.

$F_{NET} = F_1 + F_2 \Rightarrow F_1 = F_{NET} - F_2 = (5N) - (-7N) = 12N$

FIND 1ST

$F_{NET} = ma = (1.50Kg)(3.33\ m/s^2) = 5.00N$

9. Three forces act on a 2.00 kg box that is on a flat surface causing it to accelerate at 2.50 m/s^2 to the right. If one of the forces is 10.0 N to left and another one is 12.0 N to the right, determine the magnitude and direction of the third force. (Hint: find net force first).



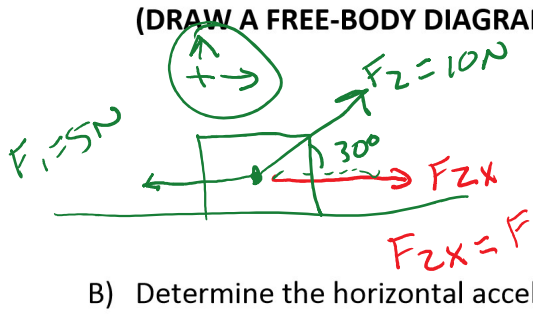
a=2.50m/s^2
M=2Kg

$F_{NET} = F_1 + F_2 + F_3$
$5N = 12N + (-10N) + F_3$
$F_3 = 3N$ RIGHT

$F_{NET} = ma = (2Kg)(2.50\ m/s^2) = 5N$ RIGHT

10. A 5.00 N force acts to left on a 2.00 kg box while a 10.0 N force at an angle of 30.0 degrees from the horizontal acts to the right.

A) Determine the net horizontal force (magnitude and direction) acting on the box. **(DRAW A FREE-BODY DIAGRAM FIRST)**



$F_{2x} = F_2 \cos 30° = 10N(\cos 30°) = 8.66N$

$F_{NET,x} = F_{1x} + F_{2x}$
$= (-5N) + (8.66N)$
$= 3.66N$ RIGHT

B) Determine the horizontal acceleration of the box (magnitude and direction).

$a_x = \frac{F_{NET,x}}{m} = \frac{3.66N}{2Kg}$

$= 1.83\ m/s^2$ RIGHT