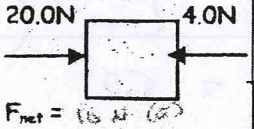
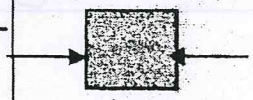
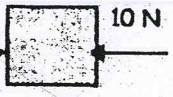
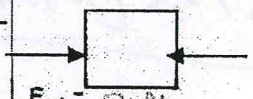
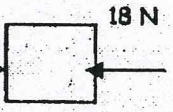
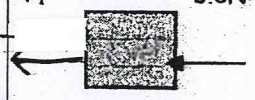
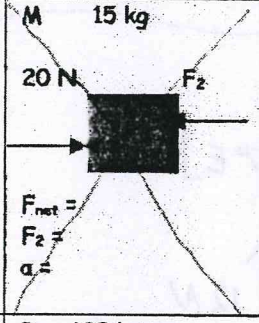
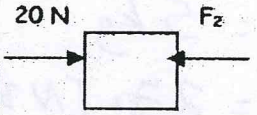
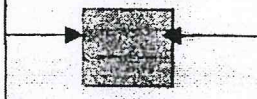
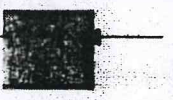
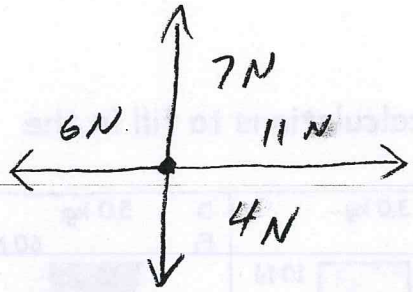
F_{NET} Practice Sheet

Examine each diagram and perform the necessary calculations to fill in the missing information in the box.

N ↑

A 8.0 kg 20.0N 4.0N  F_{net} = 16 N (E) a = 2 m/s² (E)	**B** 2.0 kg 5.0 N 15 N  F_{net} = 10 N (W) a = 5 m/s² (W)	Include directions for all velocities, accelerations and net force	**C** 3.0 kg F_1 10 N  Uniform motion F_{net} = 0 N F_1 = 10 N (E) a = 0 m/s²	**D** 5.0 kg F_1 60 N  Uniform motion F_{net} = 0 N F_1 = 60 N a = 0 m/s²
E 2.0 kg 4.0 N 12 N  F_{net} = 8 N (W) a = 4 m/s² (W)	**F** 1.0 kg 15 N 15 N  F_{net} = 0 N a = 0 m/s² v_1 = 6.0 m/s[E] v_2 = 6.0 m/s (E)	**G** 1.0 kg 20 N F_2  a = 0 m/s² F_{net} = 0 N F_2 = 20 N Type of motion Uni	**H** 2.0 kg 20 N 18 N  F_{net} = 2 N (E) a = 1 m/s² (E)	**I** 10 kg 20 N 4.0N  F_{net} = 16 N (E) a = 1.6 m/s² (E)
J 1.0 kg 20 N F_2  a= 3.0 m/s² [W] F_{net} = 3 N (W) F_2 = 23 N (W)	**K** 10 kg F_1 5.0N  a= 2.0 m/s² [E] F_{net} = 20 N (E) F_1 = 25 N (E)	**L** 10 kg F_1 5.0N  a = 2.0 m/s² [W] F_{net} = 20 N (W) F_1 = 15 N (W)	**M** 15 kg 20 N F_2  F_{net} = F_2 = a =	**N** 1.0 kg 20 N F_2  a = 0.50 m/s² [W] F_{net} = 0.5 N (W) F_2 = 20.5 N (W)
O 10 kg 6.0 N F_2  a = 0.10 m/s² [W] F_{net} = 1 N (W) F_2 = 7 N (W)	**P** 80 kg 50N F_2  V_1 = 2.0 m/s [W] V_2 = 2.0 m/s [W] a = 0 m/s² F_{net} = 0 N F_2 = 50 N (W)	**Q** 1.0 kg 7.0 N F_2  Uniform motion a = 0 m/s² F_{net} = 0 N F_2 = 7.0 N (W)	**R** 100 kg 200 N 180 N  F_{net} = 20 N (E) a = 0.2 m/s² V_1 = 0 V_2 = 1 m/s (E) Δt = 5.00 s	**S** 300 kg 500 N 600N  F_{net} = 100 N (W) a = 0.33 m/s² (W) Δt = 4.0 s V_1 = 4.0 m/s [E] V_2 = 2.7 m/s (E)
T 60 kg ~~100N~~ 40 N 40 100  F_{net} = 60 N (W) a = 1 m/s² (W) Δt = 10 s V_1 = 10 m/s [E] V_2 = 0 m/s	**U** 0.10 kg  F_{net} = 0.01 N F_2 = a = 0.10 m/s² [E]	**V** 5.0 kg 3.0 N F_2  a = 1.5 m/s² [E] F_{net} = 7.5 N (E) F_2 = 4.5 N (E)	**W** 2.0 kg 3.0 N F_2  F_{net} = 5.0 N [W] F_2 = 8 N (W) a = 2.5 m/s² (W)	**X** 300 kg 100N F_2  a = 0.33 m/s² [W] F_{net} = 99 N (W) F_2 = 199 N (W)

(1) $m = 3.5\ kg$



$a = ?$

$F_{net\,x} = 5N \rightarrow$

$F_{net\,y} = 3N \uparrow$

$F_{net} = \sqrt{3^2 + 5^2}$

$= 5.83N$

$\theta = \tan^{-1}\left(\frac{5}{3}\right)$

$= 59°$

$\therefore \vec{a} = \frac{5.83\ N\ [N\ 59°E]}{3.5\ kg}$

$\vec{a} = 1.7\ \frac{m}{s^2}\ [N\ 59°E]$

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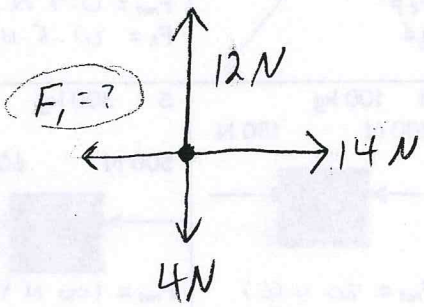
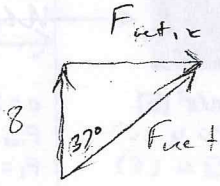
(2) $m = 5\ kg$

$a = 2\ \frac{m}{s^2}\ [N\ 37°E]$



$F_{net} = ?$



$F_{net} = ma$

$= (5\ kg)(2\ \frac{m}{s^2}\ [N\ 37°E])$

$= 10\ \frac{N}{s^2}\ [N\ 37°E]$

$\tan 37° = \frac{F_{net,x}}{8}$

$F_x = 8 \tan 37°$

$= 6.0\ N\ [\rightarrow]$

$\therefore \vec{F}_{net,x} = \vec{F}_1 + \vec{14N}$ ([→] is +)

$6N = \vec{F}_1 + 14N$

$\vec{F}_1 = 6N - 14N$

$= -8N$

$= 8N\ [\leftarrow]$