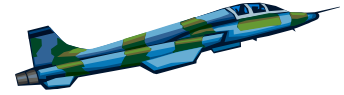


FUN WITH FORCES



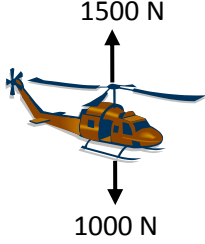


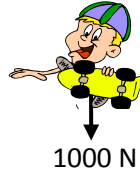



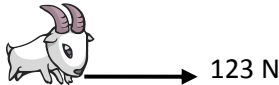

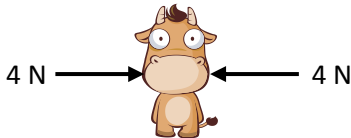
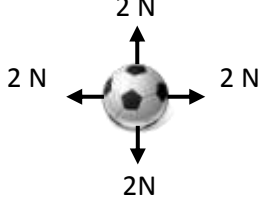
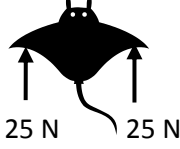
PURPOSE: To have fun learning about forces and to determine what happens to an object that experiences one or more forces. Remember, **force is a vector quantity** (has both **magnitude** (size) and **direction**). To determine the **net force** (resulting force on an object) you need to **add** all the forces that are acting on the object together. In general – forces to the **right** or **up** are considered **positive** and forces to the **left** or **down** are considered **negative**. The **net force** is always a **positive** amount. The **negative sign** just tells you the **direction** the object is moving (*see above*).

DIRECTIONS: Determine the following for each free body diagram (force diagram):

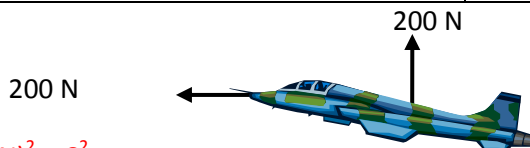
1. What is the **net force** acting on each object? (**show your work** and the correct unit (Newton))
2. Are the forces **balanced** or **unbalanced**? (**YES** or **NO**)
3. **Which way** will the object move? (**Left, Right, Up, Down, or Stay Still**)

***THE NET FORCE IS ALWAYS POSITIVE. THE NEGATIVE SIGN DESCRIBES THE DIRECTION THE FORCE IS ACTING (left or down) (numbers 2, 3, 4, 8, 14, 16, have negative signs, but the force is a positive quantity).**

1.	<p>$(-2\text{N} + 5\text{N} = 3\text{N})$, UNBALANCED, RIGHT</p>	7.	<p>$(-5\text{N} + 10\text{N} + 10\text{N} = 15\text{N})$, UNBALANCED, RIGHT</p>
2.	<p>$(-20\text{N} + 14\text{N} = -6\text{N})$, UNBALANCED, LEFT</p>	8.	<p>$(-3\text{N} + 1\text{N} = -2\text{N})$, UNBALANCED, LEFT</p>
3.	<p>$(-8\text{N} + -3\text{N} = -11\text{N})$, UNBALANCED, LEFT</p>	9.	<p>$(-1\text{N} + 3\text{N} = 2\text{N})$, UNBALANCED, RIGHT</p>
4.	<p>$(-7\text{N} - 8\text{N} = -15\text{N})$, UNBALANCED, LEFT</p>	10.	<p>$(18\text{N} - 15\text{N} = 3\text{N})$, UNBALANCED, RIGHT</p>
5.	<p>(4N), UNBALANCED, UP</p>	11.	<p>$(-1\text{N} + 1\text{N} = 0\text{N})$ PLUS (-1N) = NET FORCE -1N DOWNWARDS, UNBALANCED, DOWN</p>
6.	<p>$(-2\text{N} + 2\text{N} = 0\text{N})$ PLUS (2N) = NET FORCE 2N UPWARDS, UNBALANCED, UP</p>	12.	<p>$(-2\text{N} + 2\text{N} = 0\text{N})$ PLUS $(2\text{N} - 2\text{N} = 0\text{N})$ = NET FORCE 0 N, BALANCED, STAY STILL</p>

13	 <p>(1500N - 1000N = 500 N) , UNBALANCED, UP</p>	19	 <p>(-10N + 25N = 15N), UNBALANCED, RIGHT</p>
14	 <p>(500N - 5000N = -4500 N), UNBALANCED, LEFT</p>	20	 <p>(-1000N), UNBALANCED, DOWN</p>
15	 <p>(900N - 100N = 800N), UNBALANCED, RIGHT</p>	21	 <p>(150N - 30 N = 120N), UNBALANCED, RIGHT</p>
16	 <p>(20n + 20N - 440n = -400N), UNBALANCED, LEFT</p>	22	 <p>(123N), UNBALANCED, RIGHT</p>
17	 <p>(-3N + 6N - 6N + 3N = 0 N), BALANCED, STAY STILL</p>	23	 <p>(4N - 4N = 0 N), BALANCED, STAY STILL</p>
18	 <p>(-2N + 2N = 0 N) PLUS (2N - 2N = 0 N) = NET FORCE ZERO NEWTONS, BALANCED, STAY STILL</p>	24	 <p>(25N + 25N = 50N), UNBALANCED, UP</p>

BONUS:



$$(-200N)^2 + (200N)^2 = C^2$$

$$40000N + 40000N = C^2$$

$$80000N = C^2$$

C = 283N This is the NET FORCE of the plane. It is unbalanced and moving diagonally left and up

