LESSON MAKER PRO

Force Face-Off

Find the net force from force diagrams.

GRADE 6 · P.6.6.2

P.6.6.2 "Use mathematical computation and diagrams to calculate the sum of forces acting on various objects."

NAME _____ DATE _____

ADD BY DIRECTION

Each strip in a force diagram shows a force acting on one object. Add the forces in each direction, then subtract the smaller total from the larger total. The net force points toward the larger total, or is 0 N when the totals are equal.

WORKED EXAMPLE

Find the net force on the box.

Right | 13 N |

Left | 5 N |

1. Right total: 13 N. Left total: 5 N.
2. Subtract: 13 N - 5 N = 8 N.
3. The right total is larger, so the net force points right.

Answer: 8 N right

PRACTICE 6 problems

1 Find the net force on the cart. Give its direction.

Right | 4 N | 6 N |

ANSWER _____

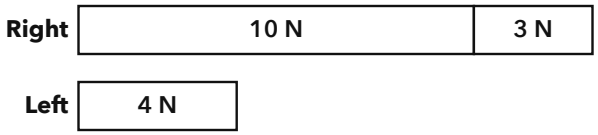
2 Find the net force on the sled. Give its direction.

Left | 11 N |

Right | 4 N |

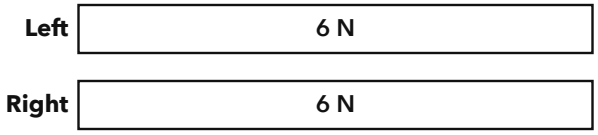
ANSWER _____

3 Find the net force on the box. Give its direction.



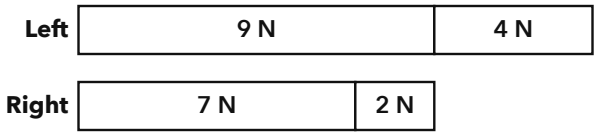
ANSWER _____

4 Find the net force on the chair.



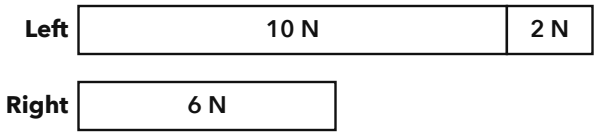
ANSWER _____

5 Find the net force on the wagon. Give its direction.



ANSWER _____

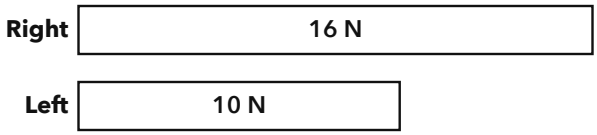
6 Find the total force in each direction and the net force on the crate.



ANSWER _____

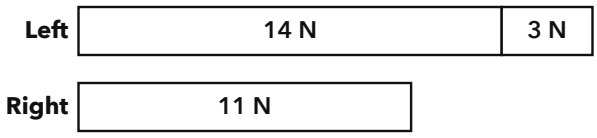
APPLY IT Show your work

1 In a robotics match, two robots push on the same foam block from opposite sides. Use the force diagram to find the net force on the block. Give its direction.



ANSWER _____

2 At a skate park, three friends push an empty cart across a smooth surface. Use the force diagram to find the net force on the cart. Give its direction.



ANSWER _____

CHALLENGE One step up

Three students push on the same box. The force diagram shows two known forces and one unknown force, x. What must x be for the net force to be 0 N? Show how you know.

FORCES ON THE BOX

Student	Direction	Force
A	Right	18 N
B	Left	7 N
C	Left	x N

WORK SPACE AND ANSWER

ANSWER KEY

Force Face-Off

GRADE 6 · P.6.6.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the net force on the cart. Give its direction.	**10 N right**
2	Find the net force on the sled. Give its direction.	**7 N left**
3	Find the net force on the box. Give its direction.	**9 N right**
4	Find the net force on the chair.	**0 N**
5	Find the net force on the wagon. Give its direction.	**4 N left**
6	Find the total force in each direction and the net force on the crate.	**Left: 12 N. Right: 6 N. Net force: 6 N left.**

PART 2 · APPLY IT

1. **6 N right** Subtract 10 N from 16 N. The larger force points right.
2. **6 N left** The left forces total 17 N. Subtract 11 N to get a net force of 6 N left.

CHALLENGE

x = 11 N. The left forces must total 18 N to match the right force, and 18 N - 7 N = 11 N.

Accept either order for the two direction totals in problem 6. A net force of 0 N has no direction.