

Tug-of-War Arithmetic

Signed numbers and $F = ma$ practice: add the pushes, solve the equation, and keep the direction attached to the answer.

[integers] [net force] [$F = ma$] [QUESTIONS ONLY] [PRINT-FRIENDLY]

NAME	PERIOD	DATE
------	--------	------

QUESTIONS ONLY - Practice independently or with a group. Use the class sheet as a model, but solve these numbers yourself.

PART A

The net-force ledger

A cart has forces of +18 N, -7 N, and -4 N acting on it.

- 1 Find the net force, including its sign. What direction will the cart accelerate?

- 2 What additional force would make the net force exactly 0 N? Give its size and direction.

PART B

Find the missing piece

A 6 kg cart accelerates at 3 m/s^2 .

- 1 Find the net force using $F = ma$.

- 2 A second cart has a net force of 24 N and mass 8 kg. Find its acceleration.

PART C

Weight on other worlds

An object has a mass of 5 kg. Use $g = 10 \text{ N/kg}$ on Earth, 4 N/kg on Mars, and 1.6 N/kg on the Moon.

- 1** Find the object's weight on all three worlds.

- 2** Where is the mass the same? Where does the weight change? Explain the difference in one sentence.

PART D

Balance the push

A sled is pulled right with 32 N and left with 11 N. Friction adds another 9 N to the left.

- 1** Find the net force and direction.

- 2** If the sled has mass 6 kg, find its acceleration.
