Tip-to-Tail Scale Drawing — Practice Worksheet

GCSE Physics: finding the resultant of two forces

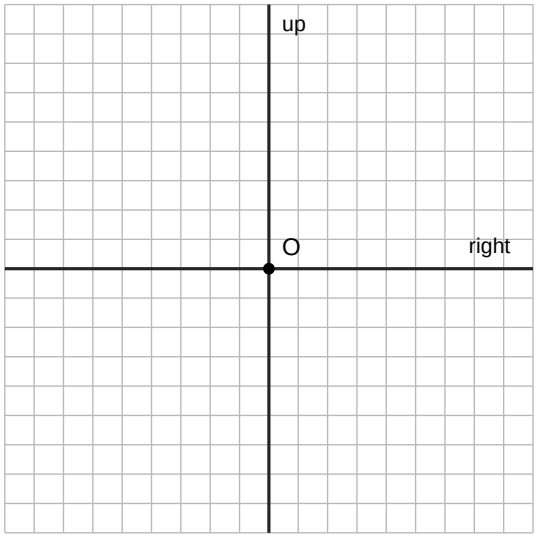
For each exercise, use a ruler and protractor to draw the two forces to scale, tip to tail, starting from the origin O. Draw the resultant from the origin to the finishing point, then measure its length (using the scale) and its angle. Use a scale of one grid square = 1 N. Answers are on the last page.

Exercise 1

Force 1: 3.0 N acting to the right

Force 2: 4.0 N acting up

Draw both forces to scale from the origin O, tip to tail, then draw and measure the resultant. Scale: 1 grid square = 1 N.

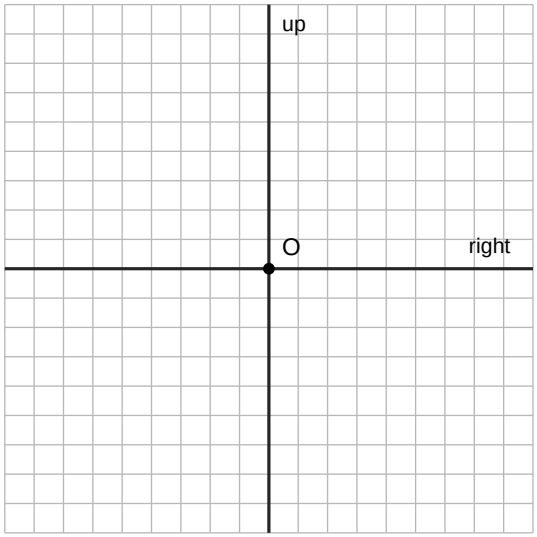


Exercise 2

Force 1: 8.0 N acting to the right

Force 2: 6.0 N acting up

Draw both forces to scale from the origin O, tip to tail, then draw and measure the resultant. Scale: 1 grid square = 1 N.



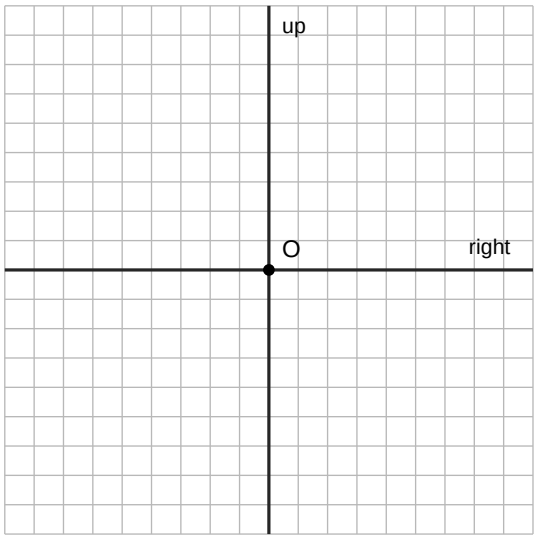
Practice Worksheet — continued

Exercise 3

Force 1: 5.0 N acting to the right

Force 2: 5.0 N at 60° above the horizontal

Draw both forces to scale from the origin O, tip to tail, then draw and measure the resultant.
Scale: 1 grid square = 1 N.

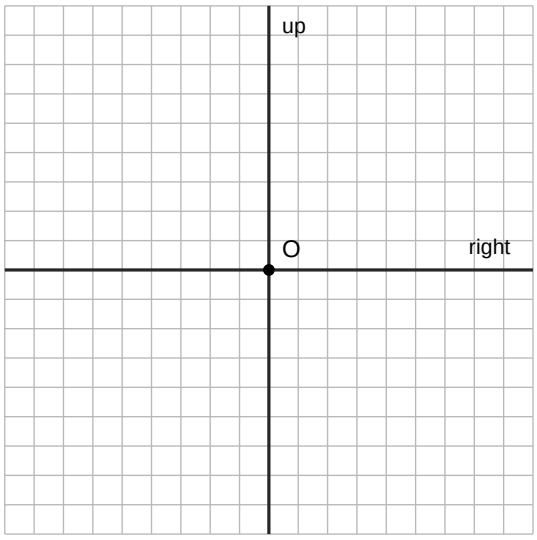


Exercise 4

Force 1: 6.0 N acting to the right

Force 2: 6.0 N acting to the left

Draw both forces to scale from the origin O, tip to tail, then draw and measure the resultant.
Scale: 1 grid square = 1 N.



Answers

Your measured values should be close to these. Measured answers within about 0.2 N and 2° are fine.

Exercise 1

Resultant: 5.0 N at 53° above the horizontal.

Exercise 2

Resultant: 10.0 N at 37° above the horizontal.

Exercise 3

Resultant: 8.7 N at 30° above the horizontal.

Exercise 4

Resultant: 0 N — the forces are balanced (in equilibrium).