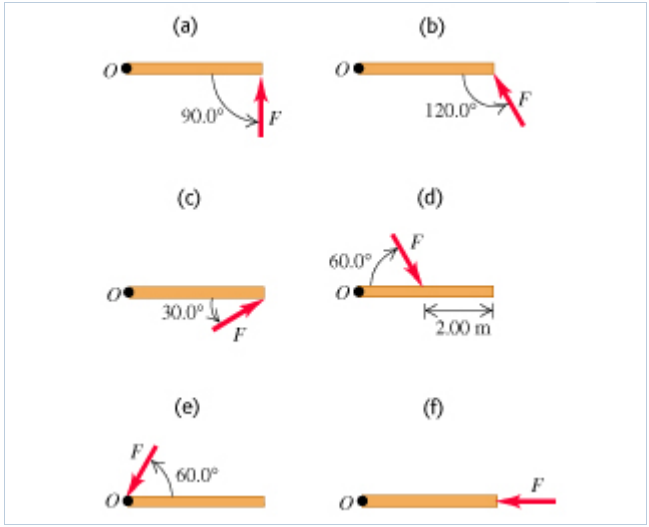
#28 Torque Post-class

Due: 11:00am on Monday, October 29, 2012

Note: You will receive no credit for late submissions. To learn more, read your instructor's Grading Policy

Exercise 10.1

Calculate the torque (magnitude and direction) about point O due to the force $\vec{F}$ in each of the cases sketched in the figure . In each case, the force $\vec{F}$ and the rod both lie in the plane of the page, the rod has length 4.00 m, and the force has magnitude 13.0 N .



Part A

Calculate the magnitude of the torque in case (a).

ANSWER:

$|\tau| =$ 52.0 $\mathrm{N \cdot m}$

Correct

Part B

Find the direction of the torque in case (a).

ANSWER:

- into the page
- out of the page
- to the right
- upward
- the torque is zero

Correct

Part C

Calculate the magnitude of the torque in case (b)

ANSWER:

$|\tau| =$ 45.0 $\mathrm{N \cdot m}$

Correct

Part D

Find the direction of the torque in case (b).

ANSWER:

- into the page
- out of the page
- to the right
- upward
- the torque is zero

Correct

Part E

Calculate the magnitude of the torque in case (c)

ANSWER:

$|\tau| =$ 26.0 $\mathrm{N \cdot m}$

Correct

Part F

Find the direction of the torque in case (c).

ANSWER:

- into the page
- out of the page
- to the right
- upward
- the torque is zero

Correct

Part G

Calculate the magnitude of the torque in case (d)

ANSWER:

$|\tau| =$ 22.5 $\mathrm{N \cdot m}$

Correct

Part H

Find the direction of the torque in case (d).

ANSWER:

- into the page
- out of the page
- to the right
- upward
- the torque is zero

Correct

Part I

Calculate the magnitude of the torque in case (e)

ANSWER:

$|\tau| =$ 0 $\mathrm{N \cdot m}$

Correct

Part J

Find the direction of the torque in case (e).

ANSWER:

- into the page
- out of the page
- to the right
- upward
- the torque is zero

Correct

Part K

Calculate the magnitude of the torque in case (f)

ANSWER:

$|\tau| =$ 0 $\mathrm{N \cdot m}$

Correct

Part L

Find the direction of the torque in case (f).

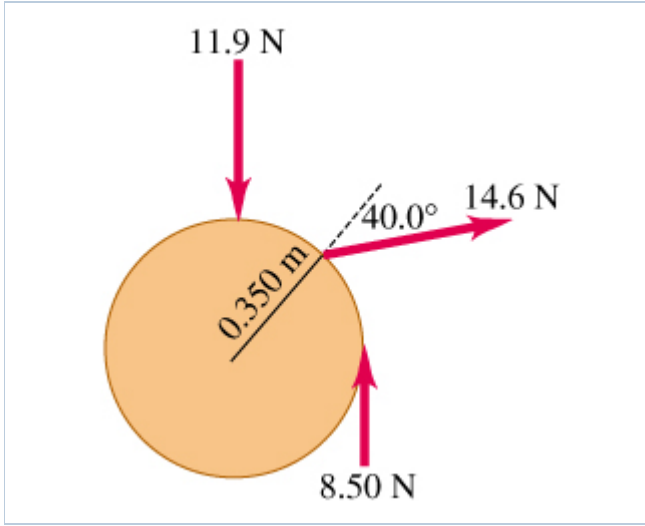
ANSWER:

- into the page
- out of the page
- to the right
- upward
- the torque is zero

Correct

Exercise 10.4

Three forces are applied to a wheel of radius 0.350 m, as shown in the figure . One force is perpendicular to the rim, one is tangent to it, and the other one makes a 40.0 ° angle with the radius.



Part A

What is the magnitude of the net torque on the wheel due to these three forces for an axis perpendicular to the wheel and passing through its center?

ANSWER:

τ = 0.310 $\mathrm{N \cdot m}$

Correct

Part B

What is the direction of the net torque in part (A).

ANSWER:

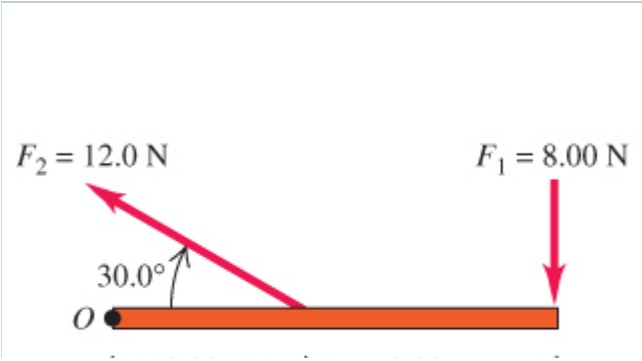
- into the page
- out of the page.

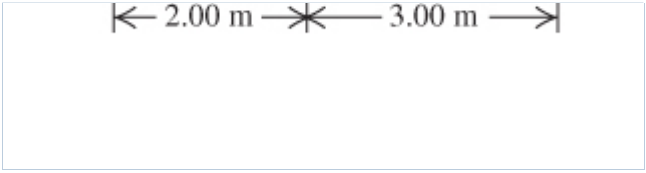
Correct

Exercise 10.2

Part A

Calculate the net torque about point O for the two forces applied as in the figure . The rod and both forces are in the plane of the page. Take positive torques to be counterclockwise.





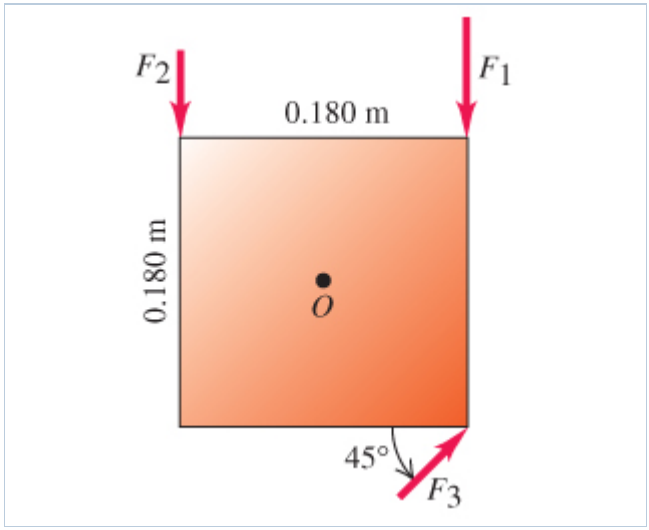
ANSWER:

τ = -28.0 $\mathrm{N \cdot m}$

Correct

Exercise 10.3

A square metal plate 0.180 m on each side is pivoted about an axis through point O at its center and perpendicular to the plate .



Part A

Calculate the net torque about this axis due to the three forces shown in the figure if the magnitudes of the forces are F_1 = 26.0 N , F_2 = 16.1 N , and

F_3 = 14.9 N . The plate and all forces are in the plane of the page. Take positive torques to be counterclockwise.

ANSWER:

τ = 1.01 $\mathrm{N \cdot m}$

Correct

Score Summary:

Your score on this assignment is 98.1%.
You received 39.22 out of a possible total of 40 points.