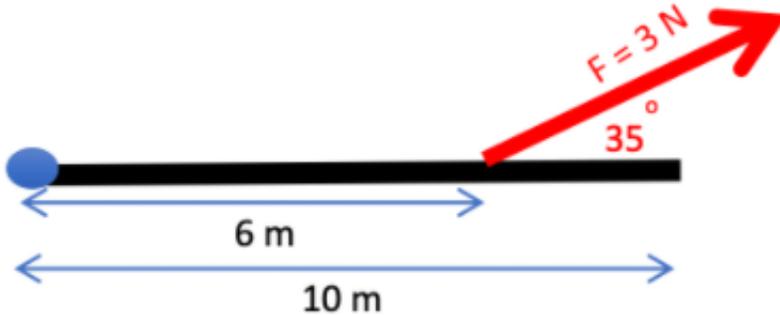


Question 1 (2 points)

Consider the force applied to a bar as shown below. What is the magnitude of the torque, assuming the bar is pivoted at the left end?



- 18 Nm
- $18 (\cos 35) \text{ Nm}$
- $18 (\sin 35) \text{ Nm}$
- $30 (\cos 35) \text{ Nm}$
- $30 (\sin 35) \text{ Nm}$

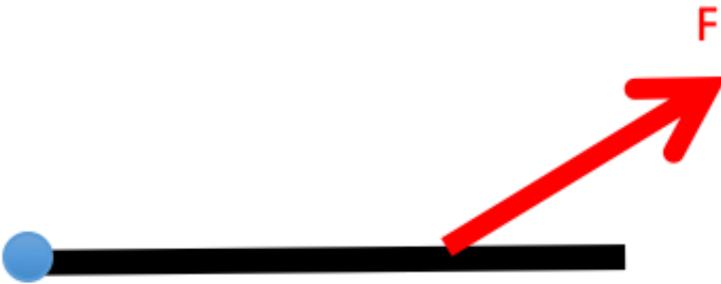
Question 2 (2 points)

Consider a force applied to a bar as shown in the previous question. The bar is pivoted at the left end and it has a moment of inertia of 18 kg m^2 . What is the magnitude of the **angular acceleration** of the rod?

- 0.57 rad/s²
- 0.82 rad/s²
- 0.96 rad/s²
- 1.4 rad/s²

Question 3 (2 points)

Consider the force applies to a bar pivoted at one end as shown. What is the direction of the torque caused by F?



- Parallel to \mathbf{F} .
- Parallel to the bar.
- Into the page.
- Out of the page.
- Into or out of the page, depending on which direction we choose as positive.

Question 4 (2 points)

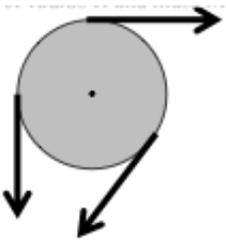
Consider the pair of vectors shown below. What is the vector direction of $\vec{A} \times \vec{B}$?



- Towards the top of the page.
- Into the page.
- Out of the page.
- Parallel to **A**.
- Parallel to **B**.

Question 5 (2 points)

A wheel of outer radius R has three forces, each of magnitude F , acting tangentially as shown. It is free to pivot about its center. Say it can be modeled as a uniform solid disk of radius R and mass M . Find the equation of motion for the pulley.



$F = \frac{1}{2}MR^2\alpha$

$FR = \frac{1}{2}MR^2\alpha$

$2FR = \frac{1}{2}MR^2\alpha$

$3FR = MR^2\alpha$

Question 6 (2 points)

A force $\vec{F} = (1, 2, 0) N$ acts at a displacement $\vec{d} = (0, -1, 1) N$ from the object's pivot. What is the torque on the object due to this force?

$\vec{\tau} = -2 Nm$

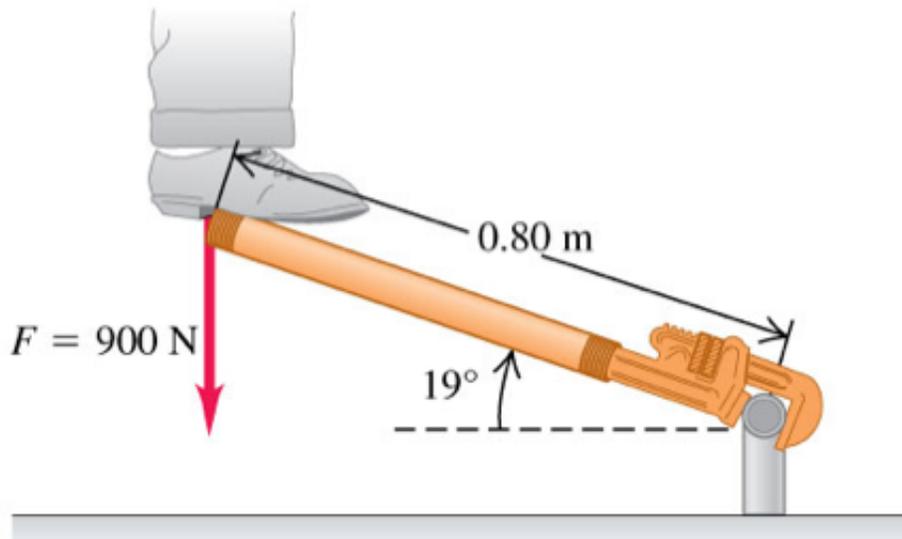
$\vec{\tau} = (4, -2, -1) Nm$

$\vec{\tau} = (-2, 1, 1) Nm$

None of the above.

Question 7 (2 points)

A plumber pushes straight down on the end of a long wrench as shown below. What is the magnitude of the torque he applies about the pipe on the lower right?



- $(0.8 \text{ m})(900 \text{ N}) \sin 19^\circ$
- $(0.8 \text{ m})(900 \text{ N}) \cos 19^\circ$
- $(0.8 \text{ m})(900 \text{ N}) \tan 19^\circ$
- None of the above.

Question 8 (2 points)

What are the SI units of linear mass density?

kg

m/kg

kg/m

kg m

Question 9 (2 points)

General Review:

Choose ALL of the correct statements below. (Think of each like its own true/false question, and select it if it is true.)

- The units of λdx are kg/m.
- In the integral for MOI, dr is the distance from the axis to a tiny mass element dm .
- An object sliding down a rough ramp that makes an angle θ with the horizontal. The magnitude of the friction force acting on it is $\mu_k mg \sin \theta$
- A ball on a string is being whirled in a vertical circle. When it is at the lowest point, it is accelerating upwards.
- A net force varies with position as $F(x) = Ax^2$ and acts on a mass m . The velocity as a function of position is $v(x) = (Ax^3)/(3m)$
- $(1, 2, 3) \cdot (0, 1, 2) = 8$

Submit Quiz

0 of 9 questions saved