

QUIZ / Mechanics - Dynamics

NAME

DATE

CLASS PERIOD

Put a check ✓ in the o next to the correct answer.

1. Dynamics is the study of what?

- ☐ The impact of loads on objects not in static equilibrium
- ☐ The impact of loads on objects in static equilibrium
- ☐ The impact of acceleration on objects in static equilibrium
- ☐ The impact of impacts, when objects collide
- ☐ The study of energy

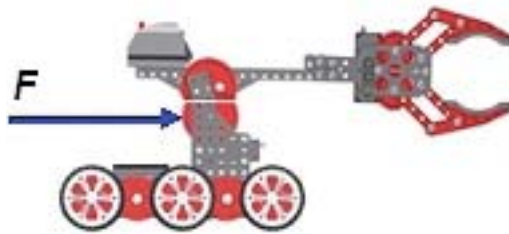
2. In dynamics, acceleration is never equal to zero.

- ☐ True
- ☐ False

3. Newton's equation, $\Sigma F = ma$, means that two systems are equivalent. These systems are ...

- ☐ Forces and kinetics
- ☐ Forces and kinematics
- ☐ Forces and kinetic energy
- ☐ Potential and kinetic energy
- ☐ Forces and moments

4. A force $F = 40$ lb is applied to a robot weighing 25 lb sitting on a smooth surface. Determine the resultant acceleration at that instance.



- ☐ 51.5 ft/s²
- ☐ 32.2 ft/s²
- ☐ 1.6 ft/s²
- ☐ 15.7 ft/s²
- ☐ 9.81 ft/s²

5. Every free-body diagram must be accompanied by a frame of reference. Why?

- ☐ The frame defines vector directions
- ☐ False, a frame of reference is not required
- ☐ It will show you the directions of vertical and horizontal
- ☐ So you know where to anchor your picture
- ☐ So you know where the earth is

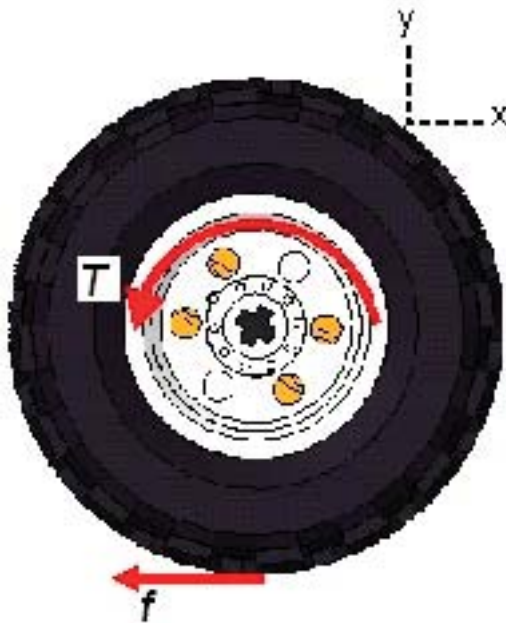
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6. The half-pound wheel receives a sudden torque of 5 in·lb as it sits on a table. The coefficient of static friction between the wheel and table is $\mu_s = 0.8$; the radius of the wheel is 1 inch. What is the magnitude of the force of friction?



- ☐ 5 lb
- ☐ 0.4 lb
- ☐ 12.5 lb
- ☐ 2.7 lb
- ☐ 6.25 lb
7. Based on your result from the last question, will the wheel roll or slip?
(Recall: $W_{\text{wheel}} = 0.5 \text{ lb}$, $T = 5 \text{ in}\cdot\text{lb}$, $\mu_s = 0.8$, $r = 1 \text{ inch}$)
- ☐ Slip
- ☐ Roll
8. A car is driving at a constant rate of speed on a perfectly level, straight strip of asphalt road, unaffected by drag. Does friction exist between the wheels and road?
- ☐ No
- ☐ Yes