

Answer on Question #41005, Physics, Mechanics

Question:

The diagram below shows a 5.0 kilogram bucket of water being swung in a horizontal circle of 0.70 meter radius at a constant speed of 2.0 meters per second. The magnitude of the centripetal force on the bucket of water is approximately

(1) 5.7 N (3) 29 N

(2) 14 N (4) 200 N

Answer:

The magnitude of the centripetal force on an object of mass m moving at speed v along a horizontal circle with radius r is:

$$F = \frac{mv^2}{r} = 5 \cdot \frac{2^2}{0.7} \cong 29 \text{ N}$$

Answer: (3) 29 N