## Answer on Question \#44435, Physics, Mechanics | Kinematics | Dynamics

A 3 kg projectile is fired at an angle of 45 degrees. What is the magnitude of the force exerted on this projectile when its at it highest position in the trajectory? Neglect any effects of air resistance.

## Solution:



Projectile motion is a form of motion in which an object or particle (called a projectile) is thrown near the earth's surface, and it moves along a curved path under the action of gravity only.

In projectile motion, the horizontal motion and the vertical motion are independent of each other; that is, neither motion affects the other.

The horizontal component of the velocity of the object remains unchanged throughout the motion. The vertical component of the velocity increases linearly, because the acceleration due to gravity is constant ( $\mathrm{g}=9.81 \mathrm{~m} / \mathrm{s}^{2}$ ).

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\begin{gathered}
F=m g(\text { downward }), \text { throughout motion } \\
F=(3.00 \mathrm{~kg})(9.81 \mathrm{~N} / \mathrm{kg})=29.43 \mathrm{~N}
\end{gathered}
$$

Answer: $\mathrm{F}=29.4 \mathrm{~N}$.

