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For each problem, do all those things you are suppose to do to solve a problem that we have talked about in class, on a separate sheet of paper.

1. Patricia, who has a mass of $75-\mathrm{kg}$, dives off the $3.0-\mathrm{m}$ springboard and initially bounces up with a velocity of $8.0 \mathrm{~m} / \mathrm{s}$ at an angle of $80 .^{\circ}$ to the horizontal.
A. What is the resultant velocity she hits the water with?
B. If she comes comes to a stop in 1.0 seconds at a depth of 0.90 meters below the water, what is the Net Force acting on her?
2. In many locations, old abandoned (not Jess) stone quarries have become filled with water once the excavating has been completed. While standing on a 10.0 -m-high quarry wall, David tosses a piece of granite into the water below.
A. If David throws the rock downwards at a $15^{\circ}$ angle below the horizontal, with a velocity of $4.5 \mathrm{~m} / \mathrm{s}$, how far out from the edge of the cliff will it hit the water?
B. If he throws it with an upward angle of $25^{\circ}$ how far from the edge will it strike the water?
3. The Fairfield county sheriff, Matt, is trying to determine the speed of a car that slid off a small bridge on a snowy night and landed in a snow pile 4.00 m below level of the road. The tire tracks in the snow show that the car landed 12.0 m measured horizontally from the bridge. How fast was the car going when it left the road? Was it speeding if the speed limit was $85 \mathrm{~km} / \mathrm{hr}$ ?
4. Superman, not Batman (Sorry Griffin) is said to be able to "leap tall buildings in a single bound." How high a building could Superman jump over if he were to leave the ground with a speed of $60.0 \mathrm{~m} / \mathrm{s}$ at an angle of $75.0^{\circ}$ to the horizontal?
5. Lydia is running to school, cause she's late, and leaping over puddles as she goes. From the edge of a $1.50-\mathrm{m}$ puddle, Lydia jumps 0.20 m high off the ground with horizontal velocity component of $3.00 \mathrm{~m} / \mathrm{s}$ in an attempt to clear it. Determine whether or not Lydia sits in school all day with wet socks on.
6. Basketball star Larry Bird, formerly with the Boston Celtics, jumps and shoots a field goal from the far end of the court into the basket at the other end, a distance of 27.6 m . The ball is given an initial velocity of $17.1 \mathrm{~m} / \mathrm{s}$ at an angle of $40.0^{\circ}$ to the horizontal from a height of 2.00 m above the ground. What is its velocity as it hits the basket 3.00 m off the ground?
7. Mark claims that he can throw a dart at a dartboard from a distance of 2.00 m and hit the $5.00-\mathrm{cm}$-wide bullseye if he throws the dart horizontally with a velocity of $15 \mathrm{~m} / \mathrm{s}$. He starts his throw at the same height as the top of the bulls-eye. See if Mark is on the mark and able to hit the bulls-eye by calculating how far his shot falls from the bulls-eye's lower edge.
8. Madi is playing tennis against a wall. She hits the tennis ball from a height of 0.5 m above the ground with a velocity of $20.0 \mathrm{~m} / \mathrm{s}$ at an angle of $15.0^{\circ}$ to the horizontal towards the wall that is 6.00 m away.
A. How far off the ground is the ball when it hits the wall?
B. Is the ball still travelling up or is it on its way down when it hits the wall after her Schott? What is the balls Resultant velocity (both magnitude and angle from the horizontal)
