TEST 1
Show all your work.
Partial credit will be given if you set up a problem correctly.
No credit will be given for correct answers presented without supporting work.
Distinguish vectors and scalars
Use consistent, appropriate units

3 problems total.
1. A 10-lb projectile is fired from point A at a height of 5ft. Its exit velocity is 80 ft/s at an angle of 60 degrees. The projectile explodes at its highest point, B, into two 5-lb fragments. One fragment moves vertically upward at \( v_y = 12 \text{ ft/s} \).

**Find:** a) the height at which the explosion occurs, b) the speed at which each fragment hits the ground.
2. The cord at A is pulled down with a speed $v(t) = 0.8t$ ft/s.

**Find:** The speed of block B. How far will B have moved after $t=1$ second?
3. Block A (2 kg) is released from rest, falls a distance $h = 0.5$ m, and strikes plate B (3 kg mass). The coefficient of restitution between A and B is $e = 0.6$, and the spring stiffness is $k = 30$ N/m.

**Find:** The velocity of block A just after the collision. Which directions do they each move?