淡江大學 101 學年度碩士班招生考試試題

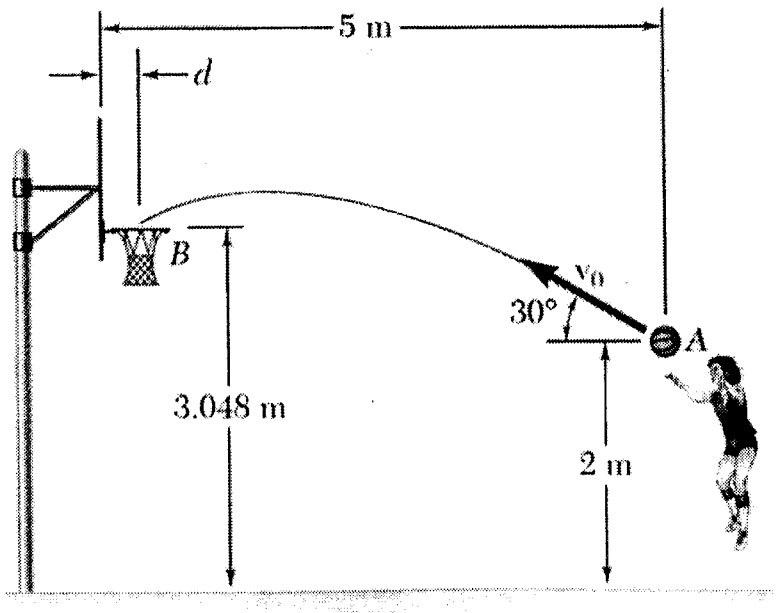
62-1

系別：航空太空工程學系　　科目：動　力　學

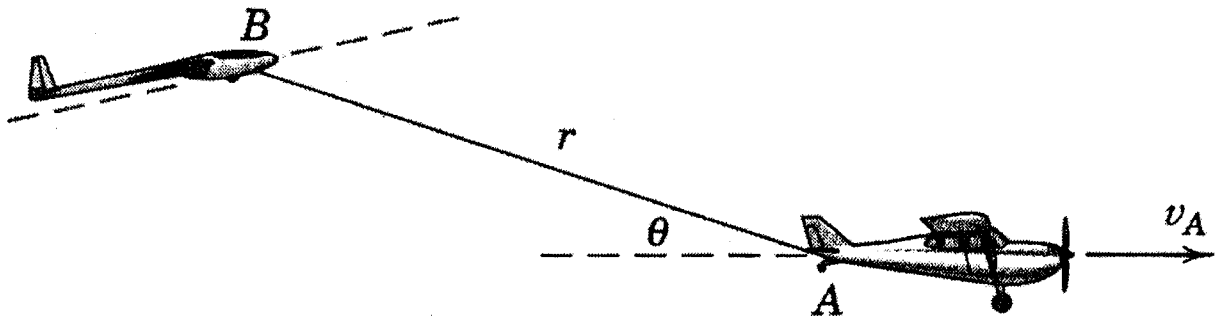
考試日期：2 月 26 日(星期日) 第 4 節　　本試題共　4 大題，　2　頁

本試題雙面印刷

1. A basketball player shoots when she is 5 m from the backboard. Knowing that the ball has an initial velocity v_o an angle of 30° with the horizontal, determine the value of v_o when d is equal to 0.3 m. (25%)



2. Airplane A is flying horizontally with a constant speed v_A =180 km/h and is towing the glider B, which is gaining altitude. If the tow cable has a length r = 60 m and θ is increasing at the constant rate of 5 degrees per second, determine the magnitudes of the velocity v_B and acceleration a_B of the glider for the instant when $\theta = 20°$. (25%)



背面尚有試題

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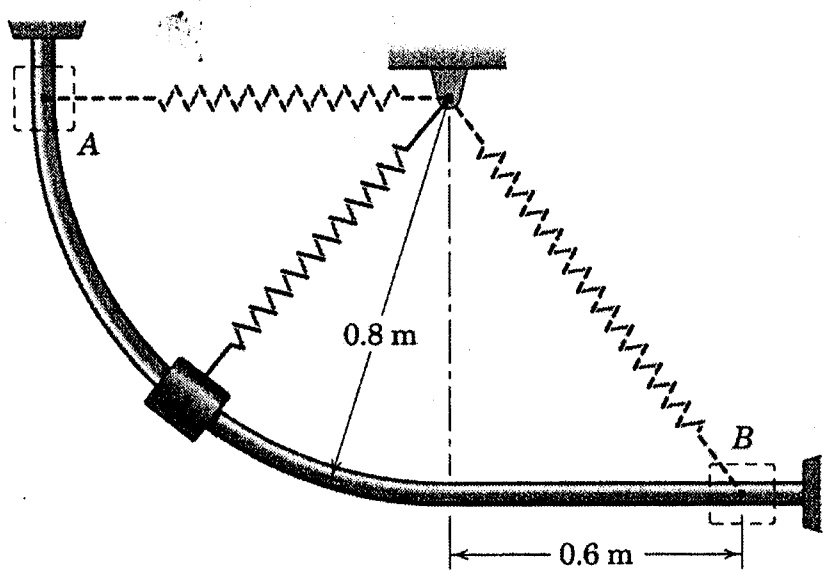
3. The spring has an unstretched length of 0.4 m and a stiffness (spring constant) of 100 N/m. The 3-kg slider and attached spring are released from rest at *A* and move in the vertical plane. Calculate the velocity *v* of the slider at it reaches *B* in the absence of friction. (25%)



4. Assume that the transport airplane has just touched down in landing and that a braking force of 35,000 lb on the rear wheels is being applied to bring the airplane to rest. The landing horizontal velocity is 125 ft/sec. Neglecting air forces on the airplane and assuming the propeller forces are zero. R_1 and R_2 are the ground reactions. What is the landing run distance with the constant braking force ? (25%)