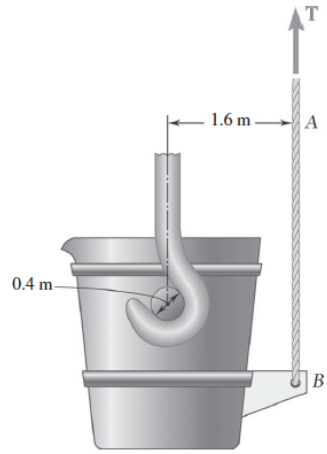
ES 208 Mechanics

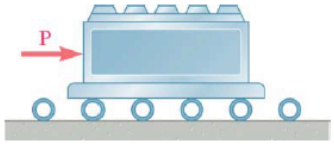
Tutorial 9

All problems are from Beer and Johnston's book



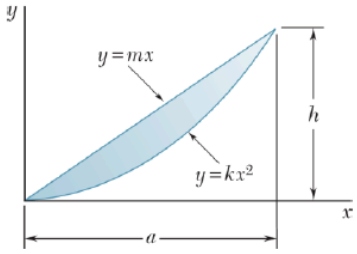
PROBLEM 8.78

A hot-metal ladle and its contents weigh 520 kN. Knowing that the coefficient of static friction between the hooks and the pinion is 0.30, determine the tension in cable *AB* required to start tipping the ladle.



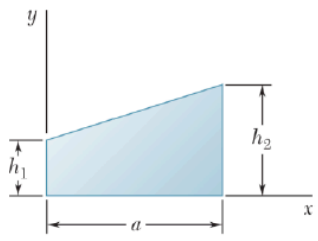
PROBLEM 8.100

A 900-kg machine base is rolled along a concrete floor using a series of steel pipes with outside diameters of 100 mm. Knowing that the coefficient of rolling resistance is 0.5 mm between the pipes and the base and 1.25 mm between the pipes and the concrete floor, determine the magnitude of the force **P** required to slowly move the base along the floor.



PROBLEM 5.35

Determine by direct integration the centroid of the area shown. Express your answer in terms of a and h.



PROBLEM 5.18

Determine the x coordinate of the centroid of the trapezoid shown in terms of h_1, h_2, and a.