

淡江大學 95 學年度碩士班招生考試試題

60-1

系別：機械與機電工程學系

科目：流體力學

准帶項目請打「V」	
✓	簡單型計算機

本試題共 2 頁 - 2

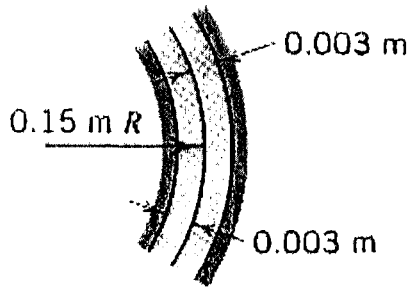


Fig. 1

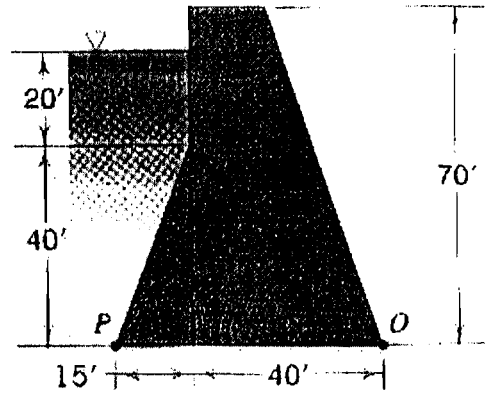


Fig. 2

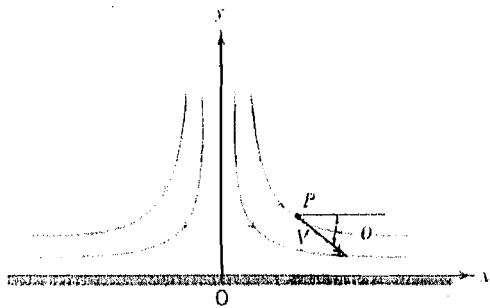


Fig. 3

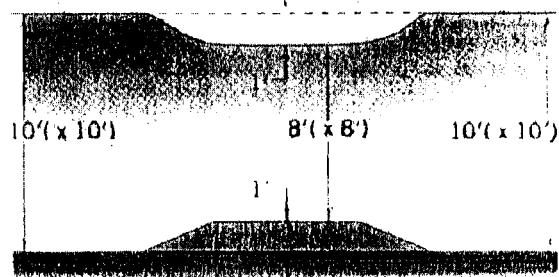


Fig. 4

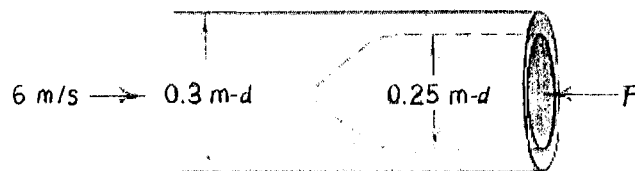


Fig. 5

淡江大學 95 學年度碩士班招生考試試題

60-2

系別：機械與機電工程學系

科目：流體力學

准帶項目請打「✓」	
✓	簡單型計算機

本試題共 > 頁 - 1

本試題雙面印製

1.
A torque (figure 1) of $4N \cdot m$ is required to rotate the intermediate cylinder at 30 r/min . Calculate the viscosity of the oil. All cylinders are 450 mm long. Neglect end effects. (20%)

2.
Using the method of components, calculate the magnitude, direction, and location of the total force on the upstream face of a section of this dam 1 ft wide (figure 2). What is the moment of this force about O ? The fluid is water. (20%)

3.
When an incompressible, nonviscous fluid flows against a plate in a plane (two dimensional) flow, an exact solution for the equations of motion for this flow is $u=Ax$, $v=-Ay$, with $A > 0$ for the sketch shown in figure 3. The coordinate origin is located at the stagnation point O , where the flow divides and the local velocity is zero. Find the velocities and acceleration in the flow. (20%)

4.
This "Venturi flume (Figure 4)" is installed in a horizontal frictionless open channel of 10 ft width and water depth 10 ft . In the "throat" of the flume where the width has been narrowed to 8 ft , the water depth is observed to be 8 ft . Calculate the flowrate in the channel. (20%)

5.
The projectile partially fills the end of the 0.3 m pipe with water (Figure 5). Calculate the force required to hold the projectile in position when the mean velocity in the pipe is 6 m/s . (20%)

◀ 注意背面尚有試題 ▶