Problem 1

SAE 30 oil at 15.6°C flows through a 3-m length of straight commercial steel pipe with a velocity of V=10 m/s . The pipe has an inner diameter of D=25.4 mm. Assume μ_{oil} = 0.6 kg/m·s and SG_{oil} = 1.017.

(a) Find the Reynolds number.
(b) Find the friction factor. Assume the flow is **fully developed**. (We'll learn what that means soon.)
(c) Find the pressure drop through the length of pipe.

Problem 2

Water at 20°C flows through a 3-m length of straight commercial steel pipe with a velocity of V=10 m/s . The pipe has an inner diameter of D=25.4 mm.

(a) Find the Reynolds number.
(b) Find the friction factor. Assume the flow is **fully developed**.
(c) Find the pressure drop through the length of pipe.

Problem 3

SAE oil at 15.6°C flows through a 3-m length of wood stave pipe with a velocity of V=100 m/s. The pipe has an inner diameter of D=254 mm. Assume μ_{oil} = 0.6 kg/m·s and SG_{oil} = 1.017.

(a) Find the Reynolds number.
(b) Find the friction factor.
(c) Find the pressure drop through the length of pipe.