# Physics 231 - 25-Oct-99

- Announcements
- Pascal's Principle
  - Hydraulic Machines
- Archimedes Principle
  - Buoyancy
- Quiz

# Pascal's Principle

- Hydraulics

# Archimedes Principle

- Buoyancy

# Q1 - Answer = a

# Q2 - Problem A - Last name A-K

A large tank filled with an incompressible fluid is equipped with two ports, A and B, fitted with pistons. The area of piston "A" is 10 $cm^2$ and that of "B" is 200 $cm^2$. If a force of 20 N is applied to piston A, how much force must be applied to piston B to keep it stationary?

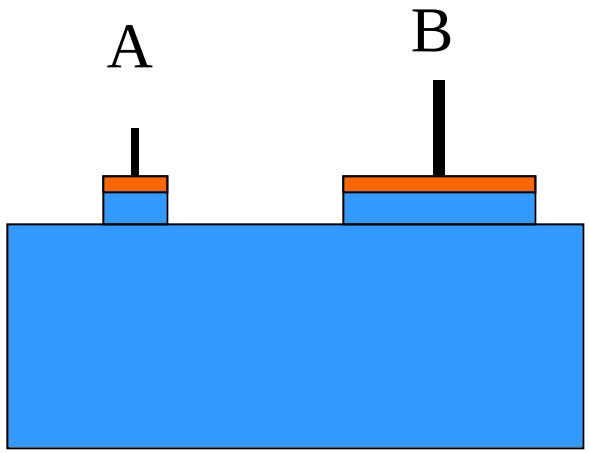
A. 20 N

B. 31 N

C. 2 N

D. 310 N

E. 400 N



# Q1 - Answer = a
# Q2 - Problem B - Last Name L-Z

- A large tank filled with an incompressible fluid is equipped with two ports, A and B, fitted with pistons. The area of piston "A" is 6 $cm^2$ and that of "B" is 60 $cm^2$. If a weight of 10000 N is placed on piston B, how much force must be applied to piston A to keep it stationary?

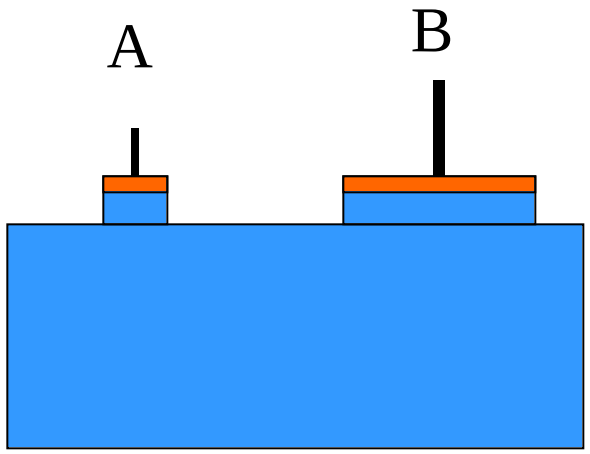
A. 600 N

B. 1000 N

C. 6000 N

D. 10000 N

E. 1600 N



# Q1 - Answer = b

# Q2 - Problem A - Last name A-K

A large water tank of radius 4 m is fed by a pipe of radius 10 cm (0.1 m). How fast does the water level in the tank rise if the speed of the water at input is 50 cm/s?

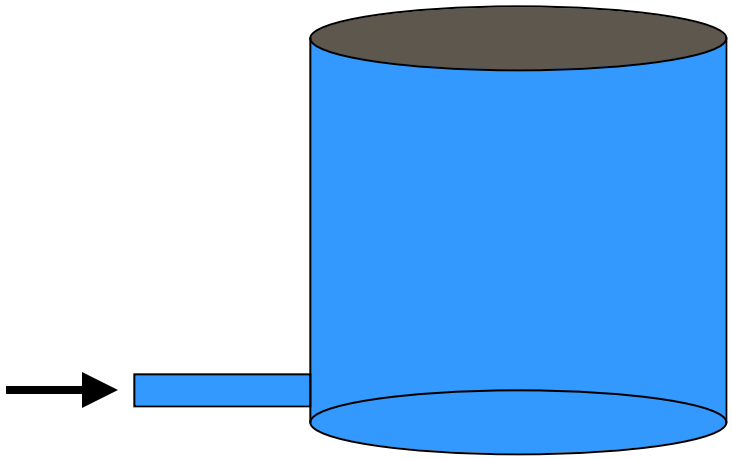
A. 12.5 cm/s

B. 1.25 cm/s

C. 3.1 x $10^{-2}$ cm/s

D. 3.1 cm/s

E. 31 cm/s



# Q1 - Answer = b
# Q2 - Problem B - Last Name L-Z

- A cylindrical water tank of 4.0 m diameter has an outlet tube of diameter 0.2 m. If the water level in the tank is seen to fall at 2 cm/s, what is the speed of the water at the outlet?

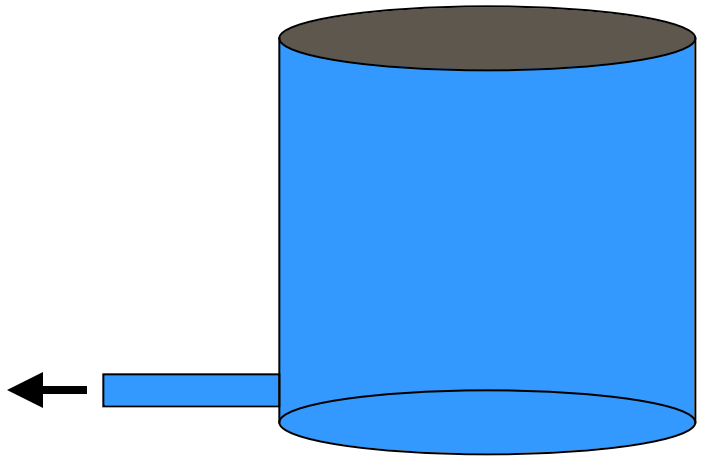
A. 800 cm/s

B. 160 cm/s

C. 40 cm/s

D. 20 cm/s

E. 2 cm/s



# Q1 - Answer = c

# Q2 - Problem A - Last name A-K

A large oil-filled tank has two port holes fitted with pistons, A and B. If the area of A is 15 $cm^2$ and that of B is 225 $cm^2$ and a force of 45 N is applied to A, how large a force must be applied to B to keep it stationary?

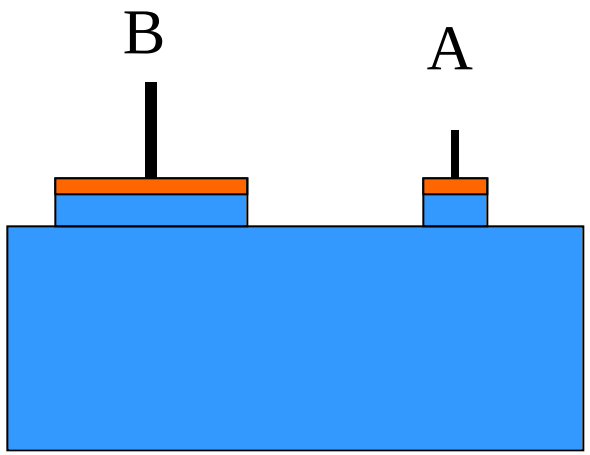
A. 3 N

B. 15 N

C. 225 N

D. 675 N

E. 174 N



# Q1 - Answer = c
# Q2 - Problem B - Last Name L-Z

- A water-filled tank has two ports fitted with pistons, A and B with areas 25 $cm^2$ and 200 $cm^2$ respectively. If a weight of 8000 N is place on B, how much force must be applied to A to keep it from moving?

A. 800 N

B. 1000 N

C. 8000 N

D. 2828 N

E. 64000 N