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A supply spacecraft in the shape of a long cylinder has a length of 100 m and its mass with payload is 1000 kg. It has strayed too close to a black hole having a mass 100 times the mass of the sun. The nose of the spacecraft points toward the black hole, and the distance between the nose and the center of the black hole is 10.0 km.

- Determine the total force on the spacecraft.
- What is the gravitational field experienced by the part of the payload in the nose, versus that in the rear of the spacecraft?

