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The foundation for a new statue is being built in the town square. Just recently, the stones in the floor of the town square have been polished smooth, essentially having no friction. The foundation is placed on top of the polished stones. A force of F Newtons is applied in the negative y direction. Is this a statically determinate situation? What needs to be added to this situation to make it statically determinate?

ANSWER:

No, this is not a statically determinate situation, because there is an unmatched force with no counterforce to hold it.

Adding some sort of connector, like a bearing, a pin, a hinge, or another fixed support would make this a statically determinate situation, provided that the lines of action of the reactive forces do not intersect on a common axis, and the reactive forces are not parallel.