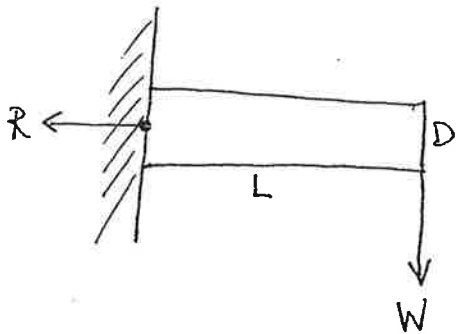


EX 6.5) Wooden beam problem



The beam can just support a
100 lb weight
hanging from its end.

1. Since the weight it can support (neglecting the beam's own weight) is inversely proportional to its length, to double the weight it can support we must halve its length.
2. We could also change the diameter of the beam.

Since ~~W~~ the weight it can support scales as $(W \propto D^3)$ and since the cross sectional area scales as D^2 ($A \propto D^2$), this

implies that

$$W \propto A^{3/2}$$

or

$$A \propto W^{2/3}$$

So we would need to increase the area by

$\sqrt[3]{4}$