

LECTURE 15

ECONOMIC APPLICATIONS

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PLAN

1. True-False Poll

2. Harvard Stadium Problem

3. Harvard Statue Problem

4. Mechanic Problem (Jam)

5. Jewelry box problem

6. Surface Area (CA)

7. Cell Phone (CA)

POLL

True or False?

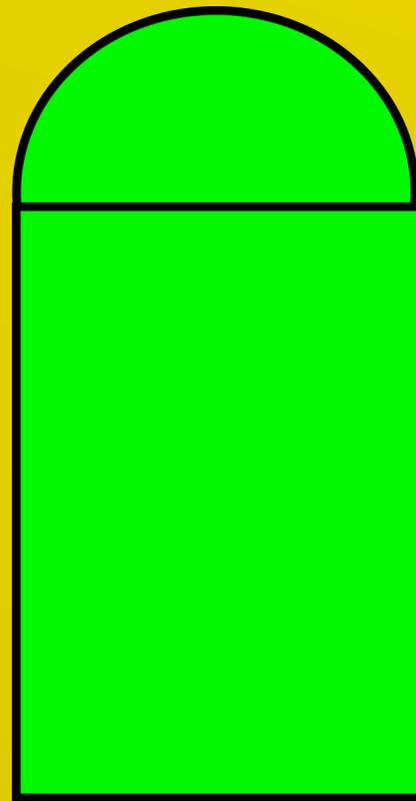
- A) If f is continuous on $[0,1]$, the global max is on either 0 or 1 or where $f'(x)=0$
- B) If f is differentiable on $(0,1)$, the global max is on either 0 or 1 or where $f'(x)=0$

STADIUM PROBLEM

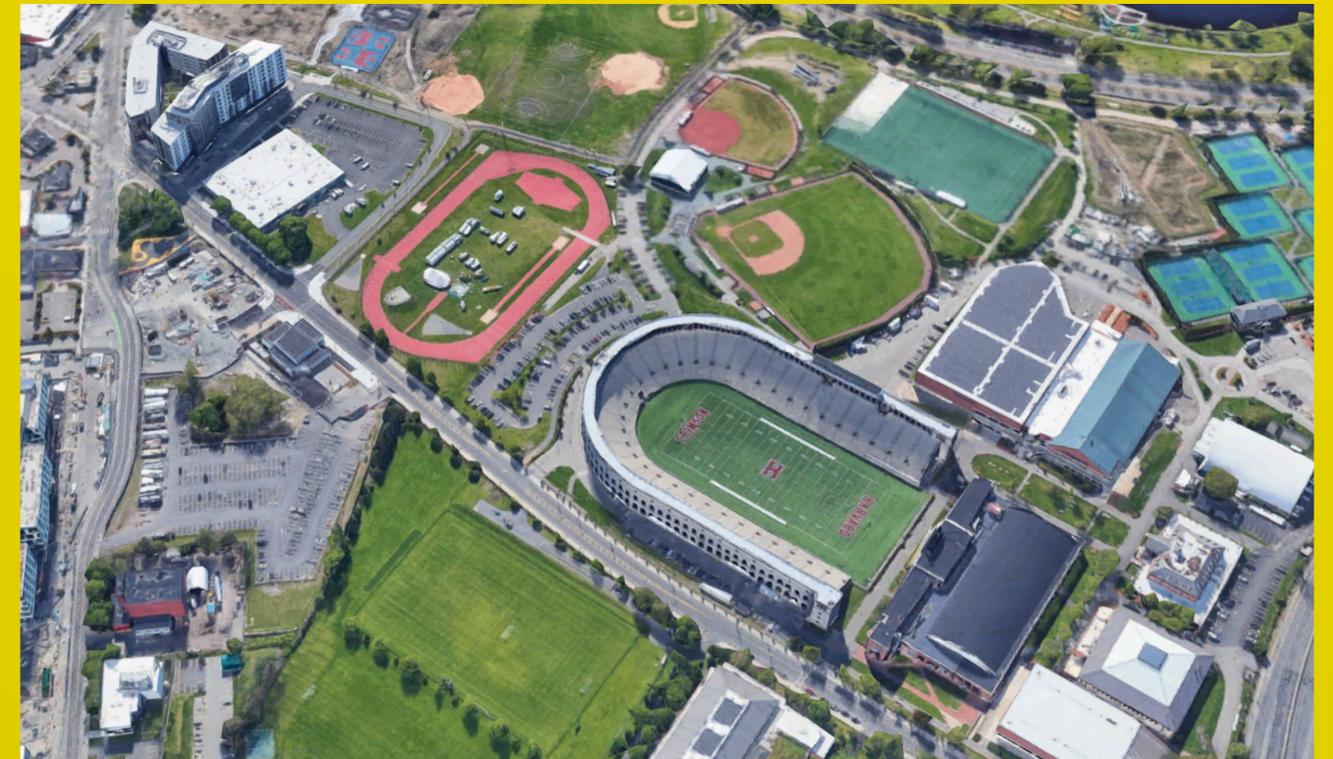
Which stadium of the following geometries has maximal area?

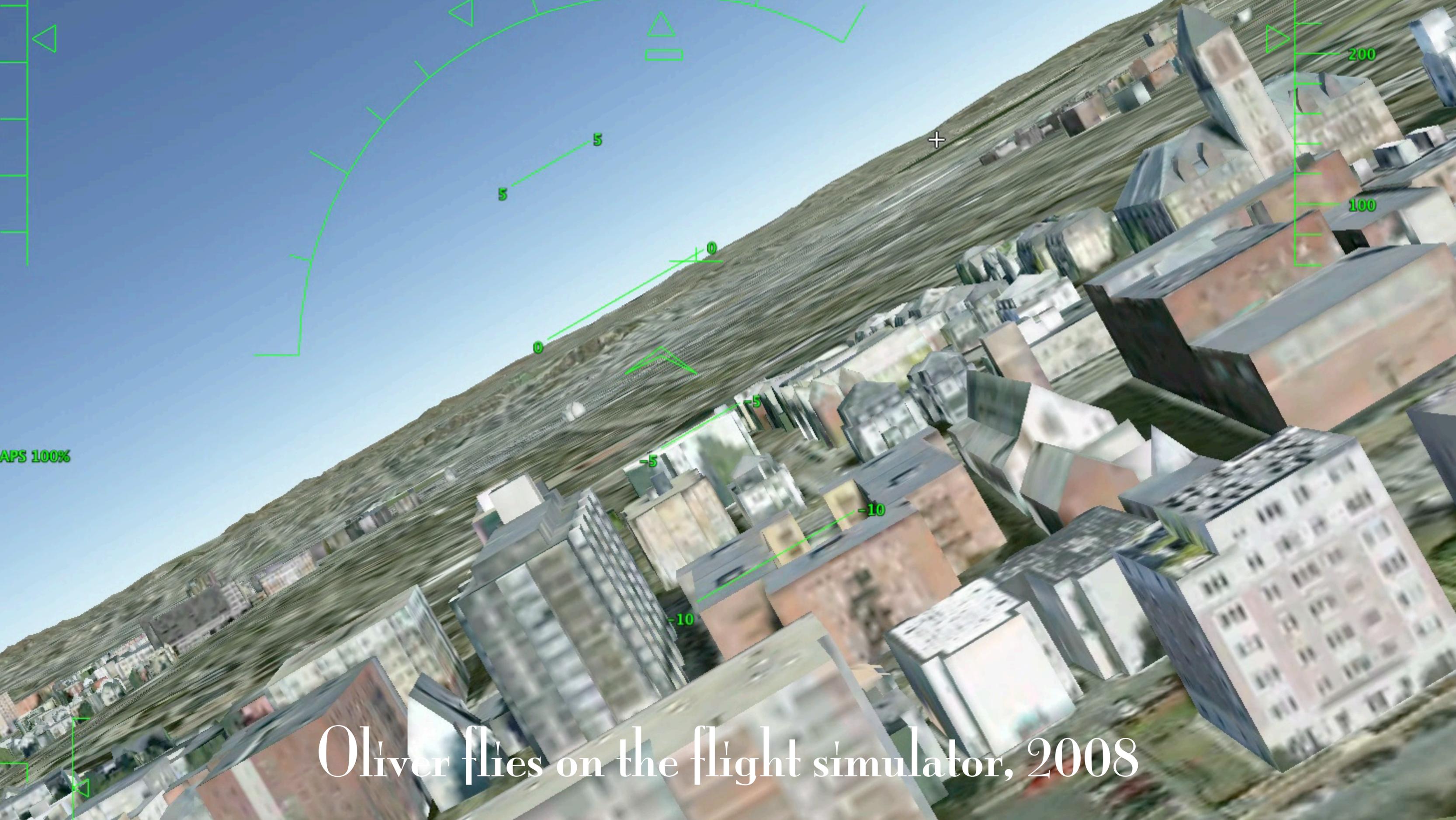
circumference length
 $\pi x + 20$

$10-x$



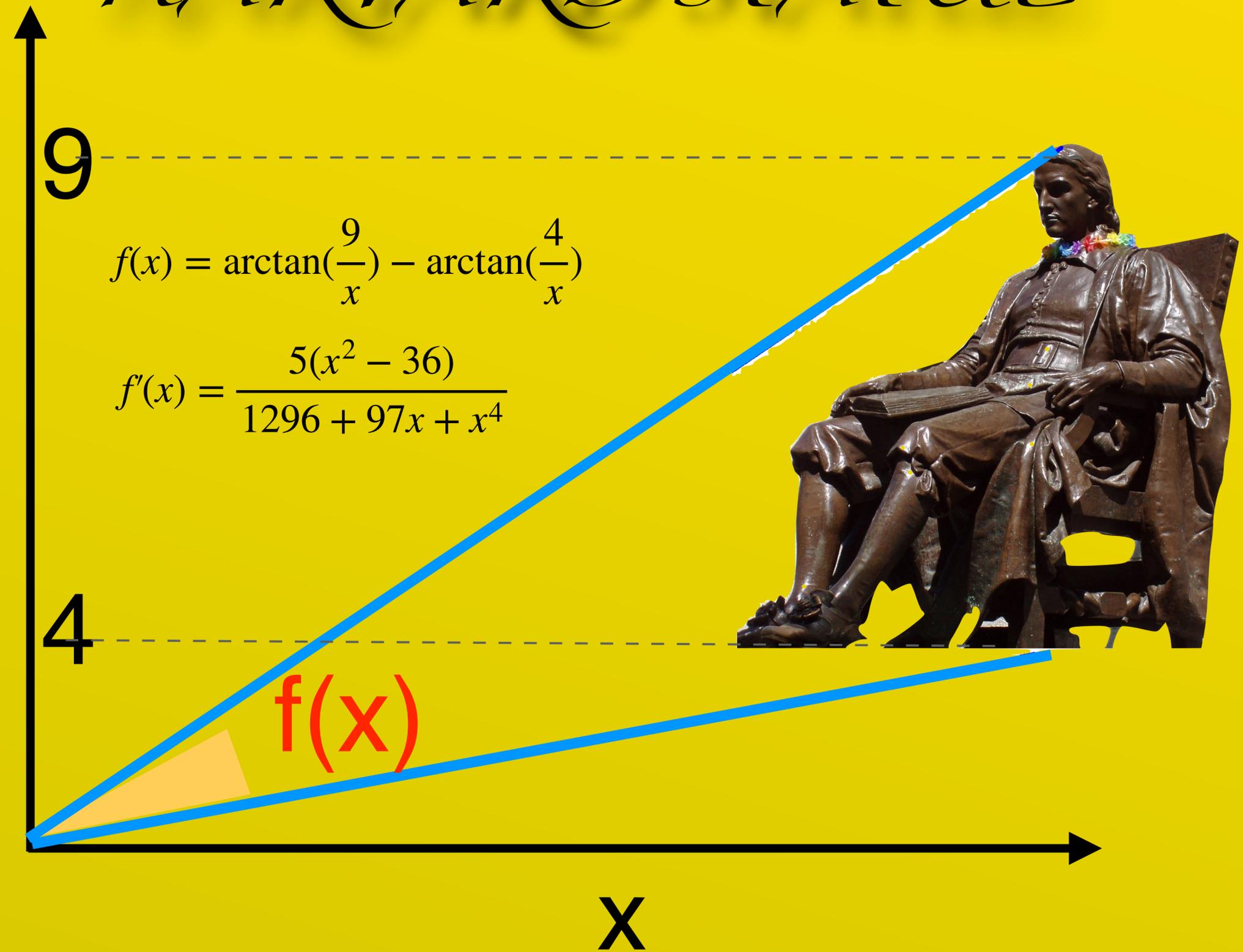
$2x$





Oliver flies on the flight simulator, 2008

HARVARD STATUE



From which distance x do you see the Harvard Statue best?

EXPERIMENT 2014

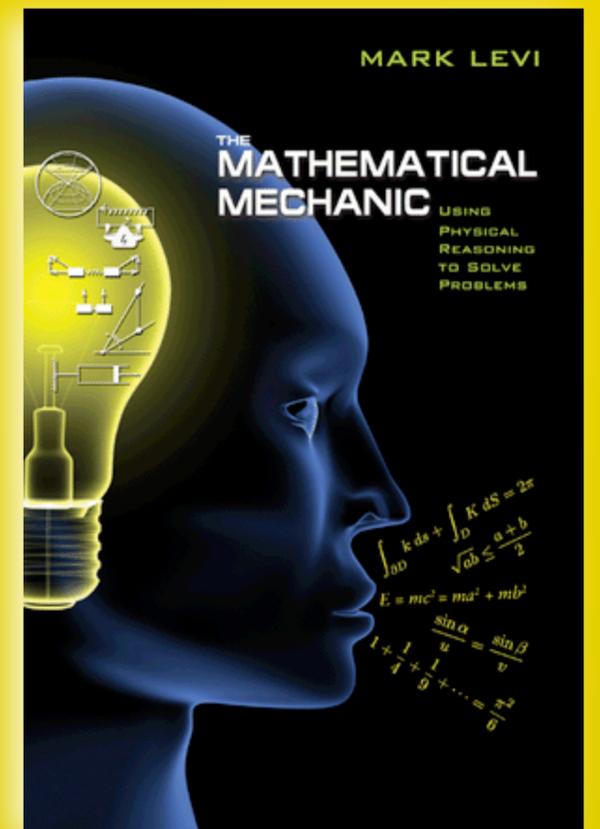
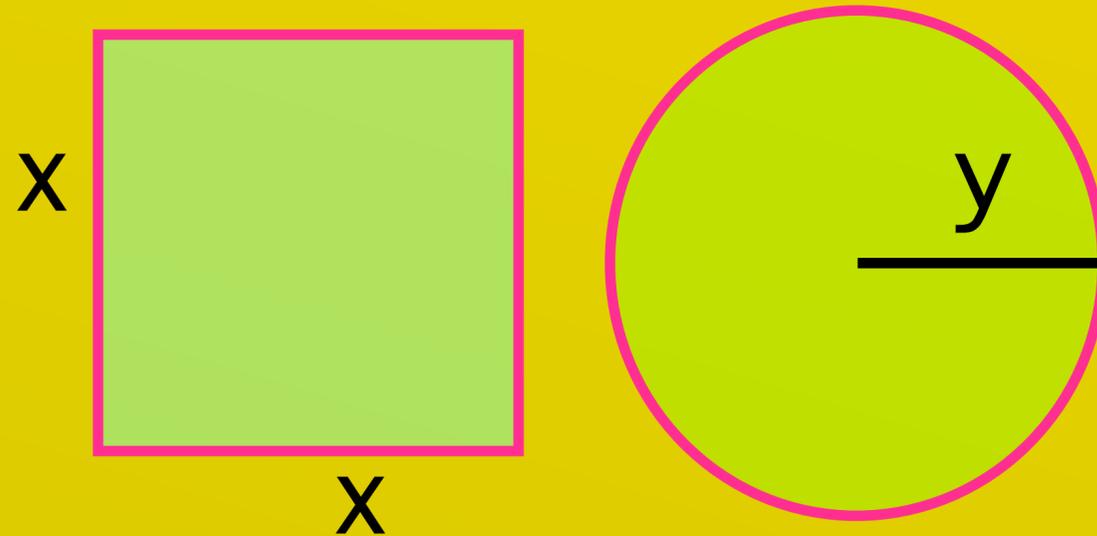


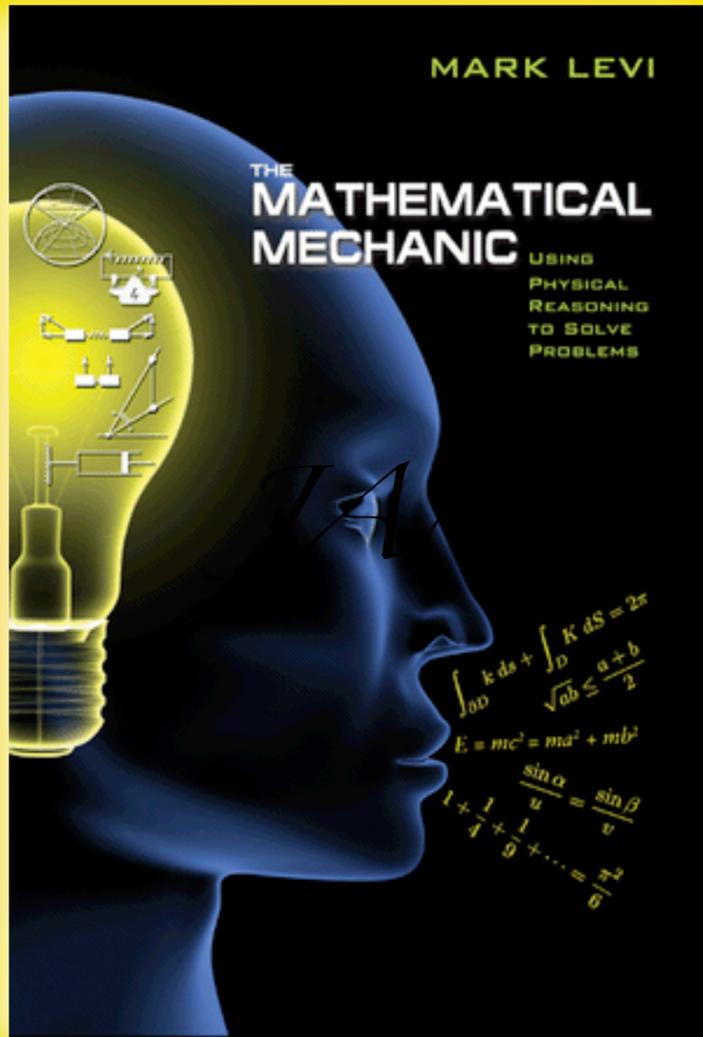
WIRE PROBLEM

JAM

Maximize the area $x^2 + \pi y^2$

with a total wire length $4x + 2\pi y = 2$





FROM LEVI:

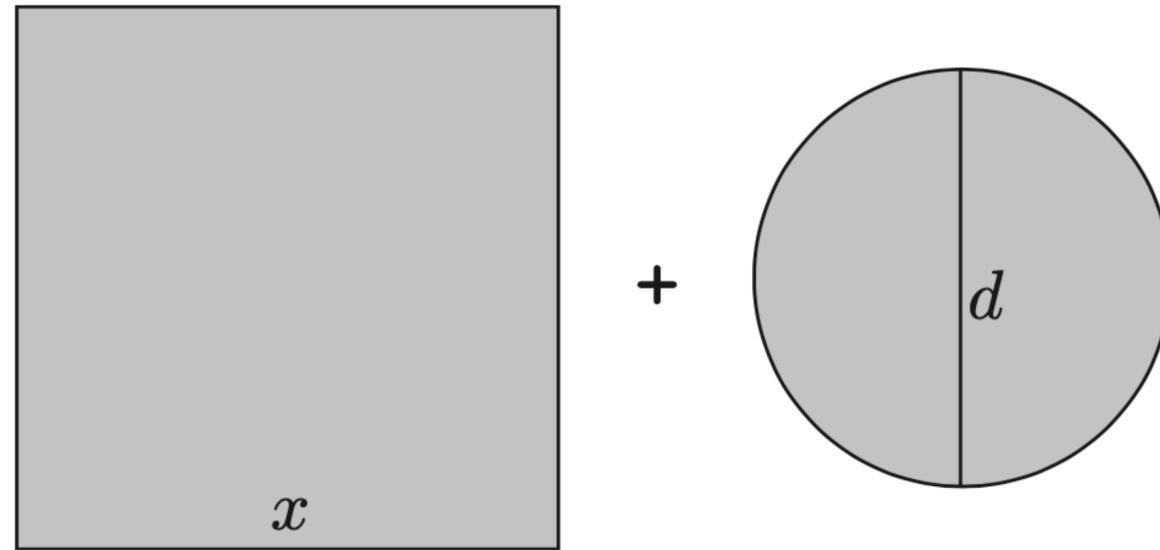


Figure 3.10. Minimize the area given the combined perimeter L .

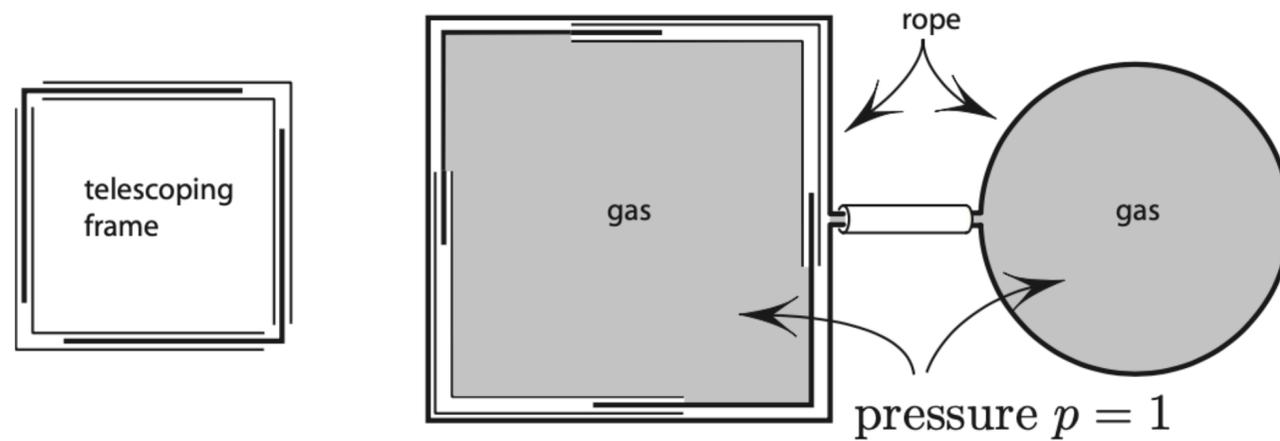
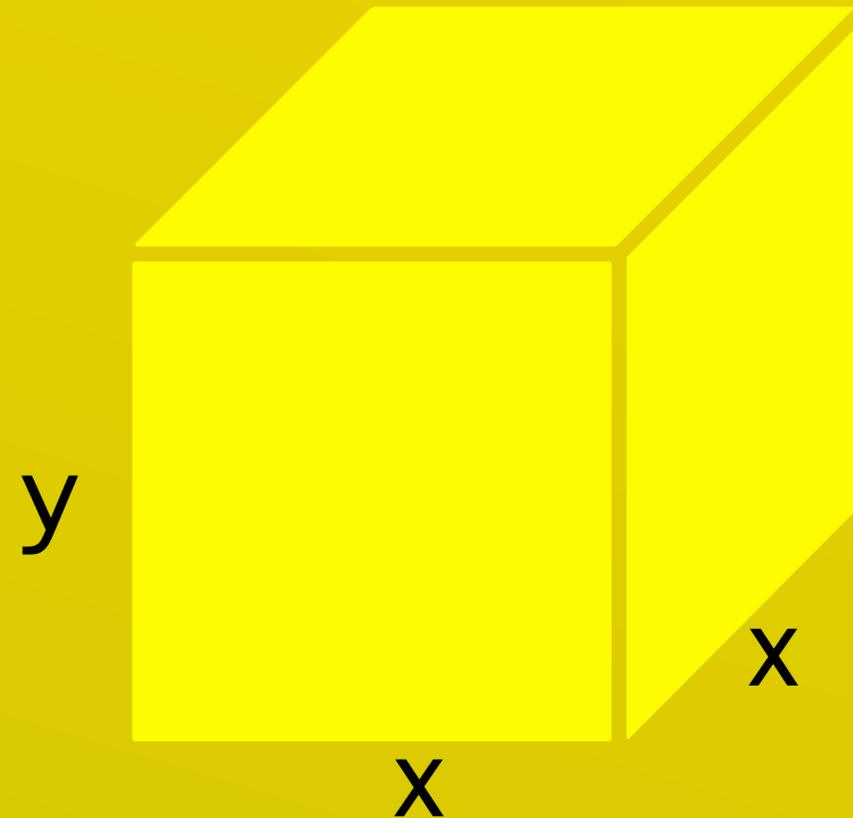


Figure 3.11. The two containers try to expand against the rope's tension.

BOX PROBLEM

Which box has maximal volume
 x^2y with cost condition

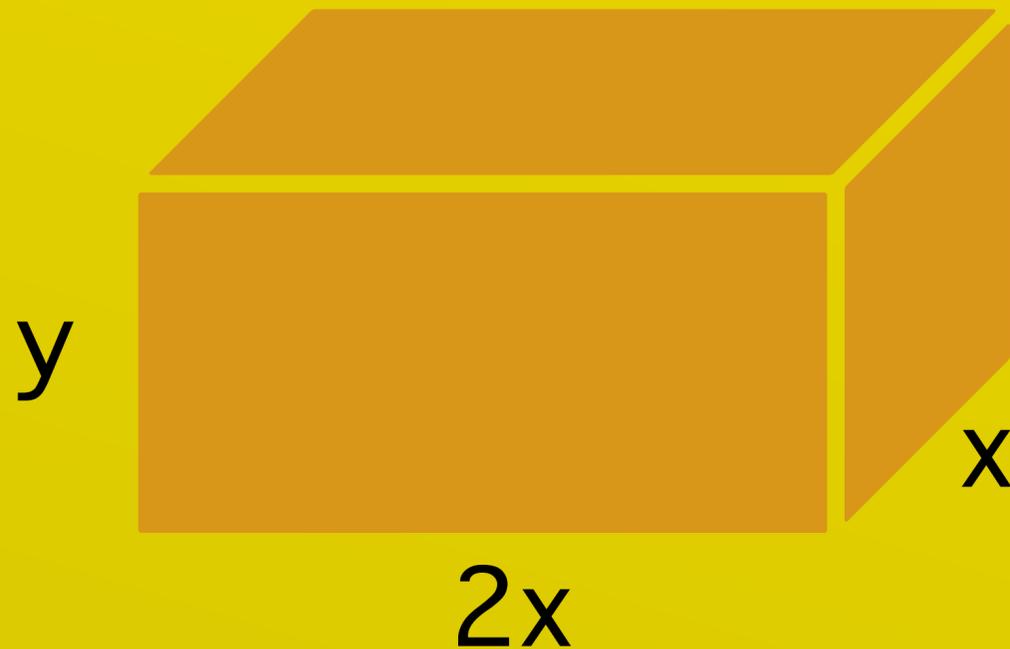
$$4xy + 8x^2 = 600$$



CAJAM 1

JAM 1

Maximize the surface area $6xy + 2x^2$
with a total volume $V=10$



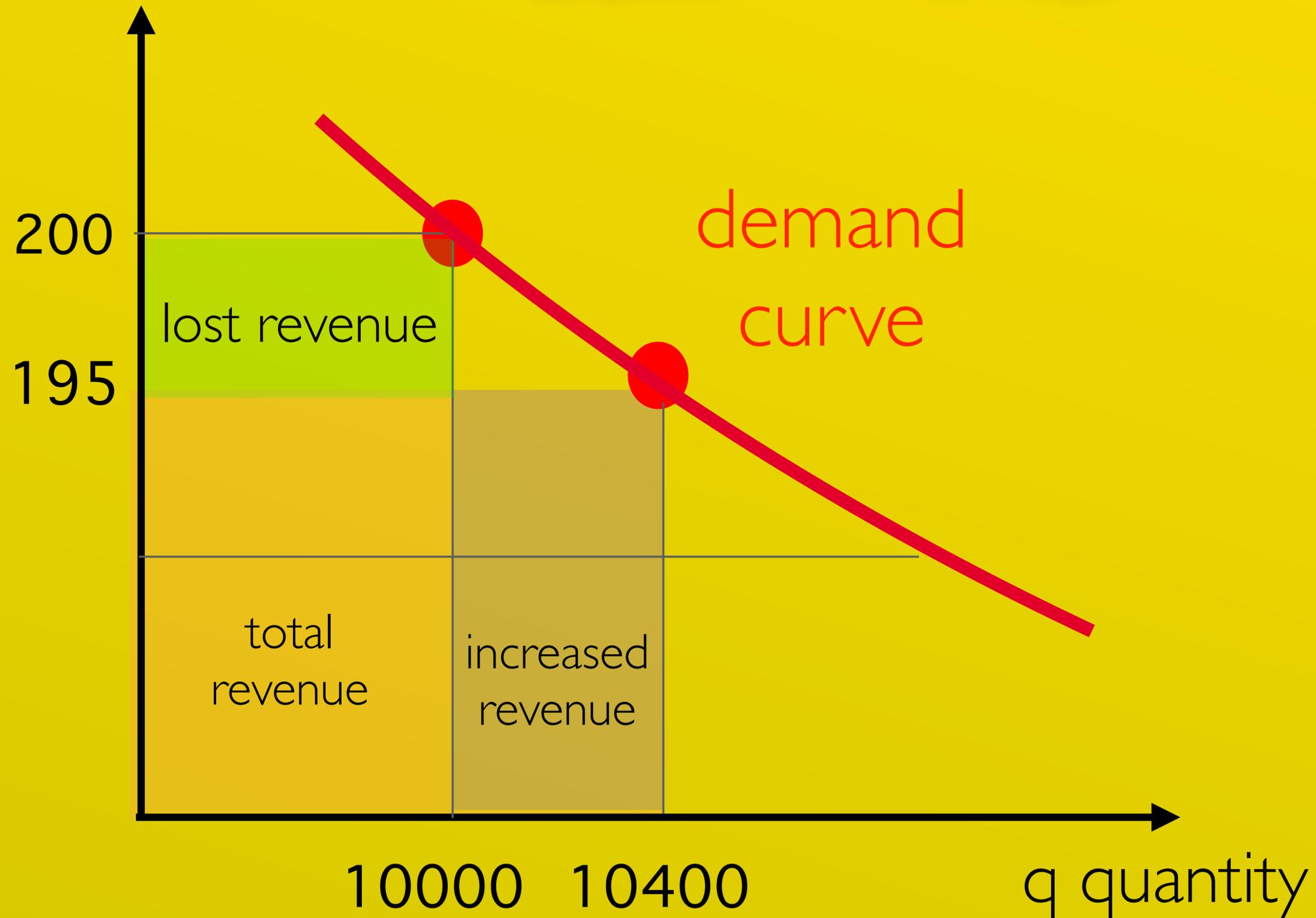
JAM 2

$$q = 10000 - 80p$$

$$\text{Revenue} = (p - 100) q$$

p prize

CELL PHONE



THE END