

Fermi Estimation

• How many piano tuners are in Chicago?

How many people are in Chicago?

Geometric mean between 1 million + 10 million

$$\sqrt{1 \cdot 10} \approx 3 \text{ million}$$

100,000 pianos \rightarrow 20,000 per year need tuning

Households 3 people / household

1 million households

$$\frac{10,000 \text{ days}}{300 \text{ days}} = \underline{33 \text{ tuners}}$$

Households that have pianos

1 in 10 have pianos

100,000 pianos

How often are pianos tuned \rightarrow

1 per 5 years

1 per 1 year

$$\frac{50,000 \text{ days}}{300 \text{ days}} = \underline{166 \text{ tuners}}$$

Pianos tuned per day

2 per day

Jordan looked up 81
on yellow pages.

Pianos tuner days worked

300 days per year

How much revenue does an MLB team make per season?

per games $\frac{1}{3}$ of revenue comes from tickets

$$\frac{\text{revenue}}{\text{game}} = 3 \cdot \underline{\underline{\# \text{ of tickets}}}$$

40,000 chairs. 80% are sold in tickets

$$\text{geometric mean } \$20 - \$200 \rightarrow \underline{\underline{\$64}} \rightarrow \frac{2}{3} \cdot 100$$

home games
↓

162 games

$$\frac{1}{2} \cdot 3 \cdot 40,000 \cdot 0.80 \cdot \frac{2}{3} \cdot 100 \cdot \underline{\underline{162}} = \underline{\underline{\$518,000,000}}$$

correct answer

$$\underline{\underline{226 \text{ million} - 378 \text{ million}}}$$