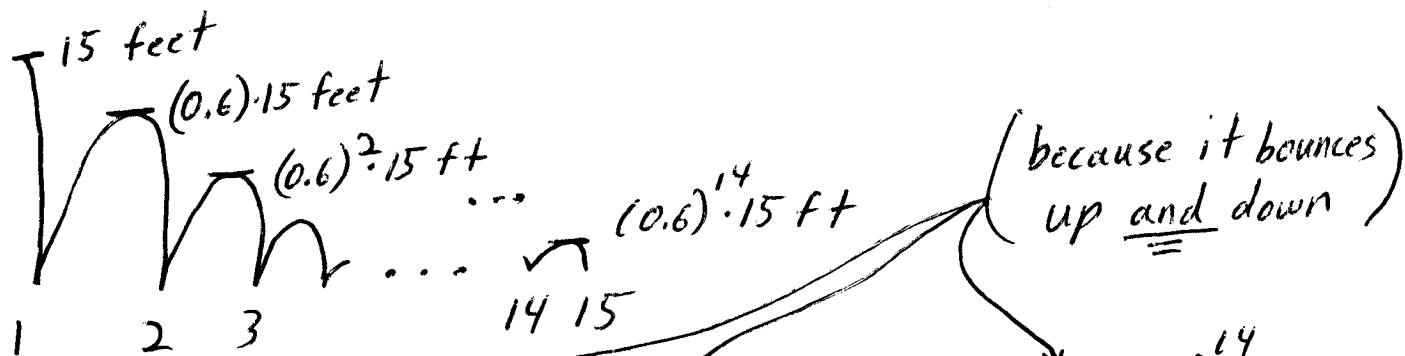


Bouncing Ball Example

Ex A ball is dropped from a height of 15 feet onto a hard surface. Each time it rebounds to a height equal to 60% of its falling distance. How far has the ball travelled through the air as it strikes the ground for the 15th time?



$$\text{Distance} = \underbrace{15}_{1\text{st}} + \underbrace{2 \cdot (0.6) \cdot 15}_{2\text{nd}} + \underbrace{2 \cdot (0.6)^2 \cdot 15}_{3\text{rd}} + \dots + \underbrace{2 \cdot (0.6)^{14} \cdot 15}_{15\text{th}}$$

$$= 15 + 2(15)(0.6) \left[1 + (0.6) + (0.6)^2 + \dots + (0.6)^{13} \right]$$

(Need sum to start at $1 = (0.6)^0$)

$$= 15 + 18 \frac{1 - (0.6)^{13+1}}{1 - (0.6)} \approx \boxed{59.966 \text{ feet}}$$