A hundred squash balls are tested by dropping from a height of 100 inches and measuring the height of the bounce. A ball is “fast” if it rises above 32 inches. The average height of bounce was 30 inches and the standard deviation was ¾ inches. What is the chance of getting a “fast” standard ball?

We have normal distribution with mean 30 inches and standard deviation – $\frac{3}{4}$:

m = 30

σ= ¾

And we need to know:

$P\ (\ x > 32)$

$P\ (\ x > 32) = \int_{32}^{\infty} f(x)dx$

$f(x)$ - probability density function

The normal distribution has probability density:

$f(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-m)^2}{2\sigma^2}}$

Therefore:

$P\ (\ x > 32) = \int_{32}^{\infty} \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{(x-m)^2}{2\sigma^2}} dx$

Calculating this integral:

$P\ (\ x > 32) = 0.00383 = 0.383\ \%$

Answer: 0.383 %