Normal distribution

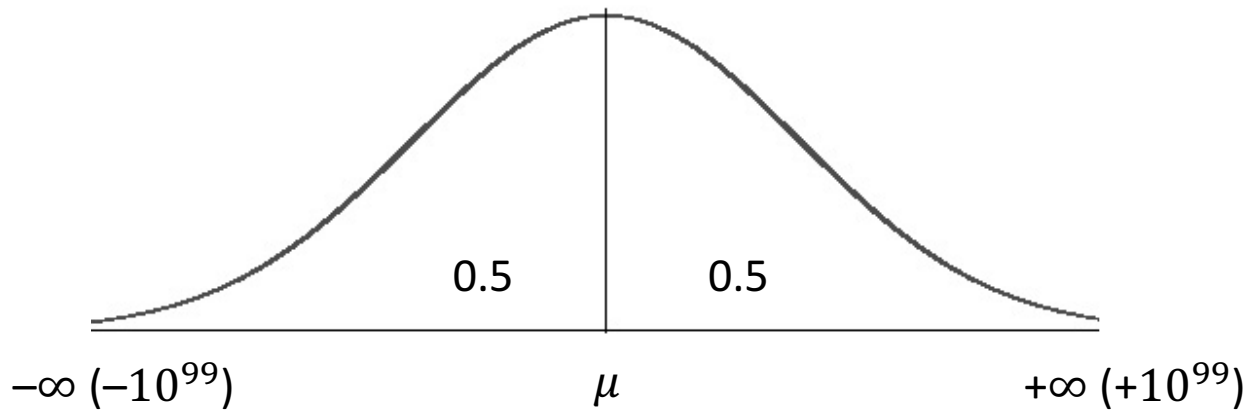$$-\infty\ (-10^{99}) \qquad\qquad \mu \qquad\qquad +\infty\ (+10^{99})$$

Symmetric bell shape

Mean is in the middle

All x values are real numbers

From $-\infty$ to $+\infty$

Area below curve = Probability

Total probability = 1

Probability of each side = 0.5

GDC Skills

Casio

Find probability

MENU → STAT → F5 STAT → F3 DIST → F1 NORM → F2 Ncd

Find X or Z value

MENU → STAT → F5 STAT → F3 DIST → F1 NORM → F3 InvN

TI–84

Find probability

2nd → vars → 2: normalcdf(

Find X or Z value

2nd → vars → 3: invNorm

TI-nspire

Find probability

Menu → 5: Probability → 5: Distributions → 2: Normal Cdf →

Find X or Z value

Menu → 5: Probability → 5: Distributions → 3: Inverse Normal (The area is counted from the most left hand side to the x value.)

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2

Find probability

1. The wrist measurements of 20 students are normally distributed with a mean of 12 cm and a standard deviation of 0.8 cm.

(a) Find the probability of students with wrist measurements smaller than 11 cm.

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(b) Find the probability of students with wrist measurements greater than 13 cm.

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(c) Find the probability of students with wrist measurements between 10.4 and 14.2 cm.

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Find X value

1. $\mu = 122$, $\sigma = 2.1$

Given that $P(X < a) = 0.732$, find the value of a.

2. $\mu = 53.2$, $\sigma = 5.2$

Given that $P(X < a) = 0.432$, find the value of a.

Exercise

Paper 1

1. The random variable X is normally distributed with a mean of 100. The following diagram shows the normal curve for X.

Let R be the shaded region under the curve, to the right of 107. The area of R is 0.24.

(a) Write down P(X > 107).

(b) Find P(100 < X < 107)

(c) Find P(93 < X < 107)

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Exercise

Paper 2

1. ▦ In a large city, the time taken to travel to work is normally distributed with mean μ and standard deviation σ. It is found that 4% of the population take less than 5 minutes to get to work, and 70% take less than 25 minutes.

Find the value of μ and of σ.

2. 🖩 A random variable X is normally distributed with $\mu = 150$ and $\sigma = 10$. Find the interquartile range of X.