

Portlandia Television is a regional manufacturer of big screen televisions. The number of defective televisions produced in its Portland factory in any given week is normally distributed with a mean of 80 televisions, and a standard deviation of 15 televisions.

1 Find the proportion of weeks where Portlandia produces **more than 89** defective televisions in its Portland factory.

Norm.Dist

72.6%



$P(X < 89)$ but we want more than, so we subtract this % from 100%

Answer

27.4%

2

The Chief Operating Officer (COO) will receive a bonus if the **average** weekly number of defective televisions is less than **78** for a **13-week** period. The COO gets fired if the average weekly number of defective televisions exceeds **83** for a 13-week period. Find the probability that Portlandia's COO keeps his job but fails to earn the bonus.

Norm.Dist

31.5% 76.5%

Interval probabilities require two norm.dist calculations

Answer

44.9% (76.5%-31.5%, note small one tenth difference due to rounding)

n = 13

Glamour Tips is an on-line magazine available throughout the world. The number of “active users” per second can be approximated by a normal distribution with a mean of 14,000 and a standard deviation of 4,000.

1

The site will freeze if the number of active users per second **exceeds 19,000**. What proportion of the time is the site frozen?

Norm.Dist **89.4%**



$P(X < 17\%)$ **but we want greater than (more), so we subtract this % from 100%**

Answer **10.6%**

2

Glamour Tips can charge an advertising premium if the **average** number of active users **exceeds 14,250** over a **ten-minute period**. If a ten-minute period is chosen at random, what is the probability that Glamour Tips earned a premium for that period?


Norm.Dist **93.7%**

Assume $n = 600$ - ten minutes X 60 seconds per minute = 600

Answer **6.3%**

Timberlake Dance is a national dance troop. The percentage of unsold seats for their performances varies considerably for each performance, but it can be estimated using a normal distribution with a mean of 17.8% and a standard deviation of 5.7%. The troop performs one show per night, plus a matinee on Thursday, Saturday and Saturday.

1 What is the probability that the percentage of empty seats is less than **15%** for a performance?
Norm.Dist **31.2%**
Answer **31.2%**

2 The troop loses money if the **average** percentage of empty seats exceeds **17%** for any given week. What proportion of the weeks does Timberlake Dance lose money?
Norm.Dist **32.9%** **n= 10 performances, one each night + three matinee shows = 10 total**

 $P(X < 17\%)$ **but we want greater than (more), so we subtract this % from 100%**
Answer **67.1%**

Each day, Big Winner Casino's black jack tables earn an amount that is distributed normally with a standard deviation of \$26,000, and a mean of \$143,000.

1

The pit boss becomes suspicious when a table earns less than **\$110,000**. What proportion of the time is the pit boss suspicious due to low table earnings?

Norm.Dist 10.2%

Answer 10.2%

2

Every **month** where Big Winner earns an **average** of **\$138,000** or **more**, it makes a profit. Find the probability that Big Winner Casino makes a profit in any given month.

Norm.Dist 14.6%

Assume $n = 30$ - a typical number of days in a month



$P(X < 138,000)$ but we want greater than (more), so we subtract this % from 100%

Answer 85.4%