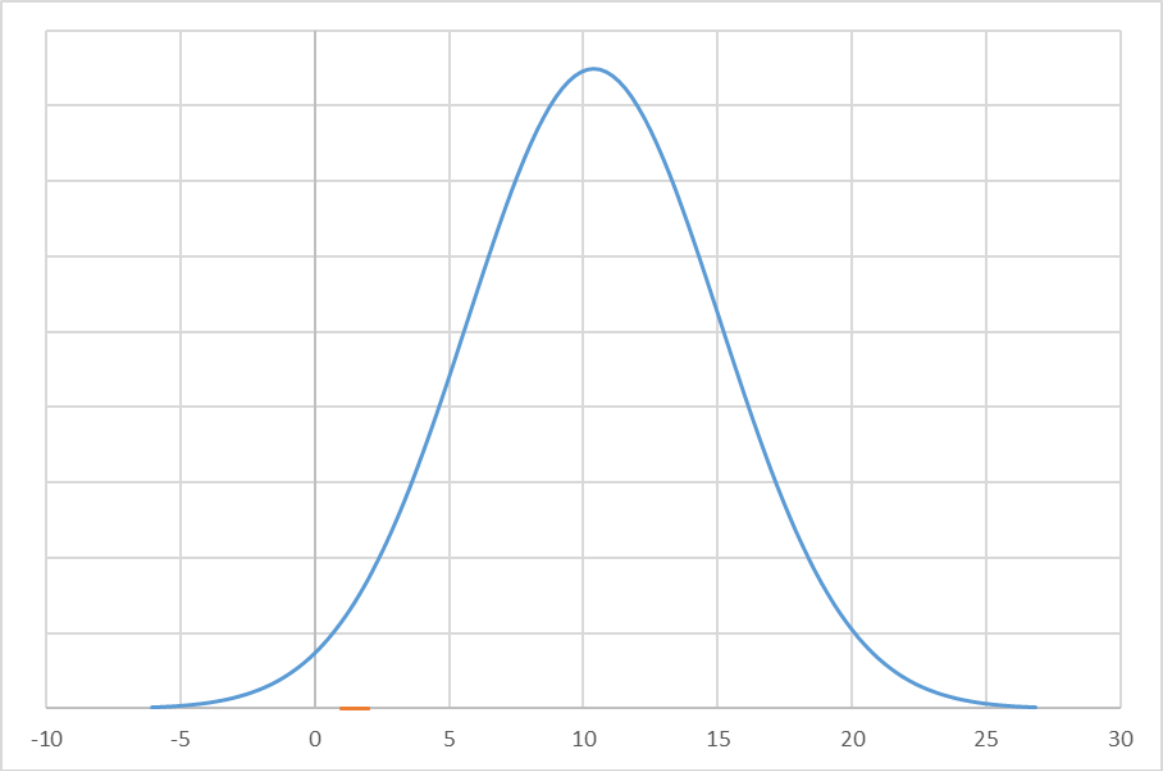
Question #71545, Math / Statistics and Probability

a tree farm owner measure 27 trees in his garden centre. mean diamter of 10.4 inches and standard dev of 4.7 inches.

Draw normal model for tree farm

Solution

Normal model:



What size would you expect the central 95% of trees to be?(Diagram required)

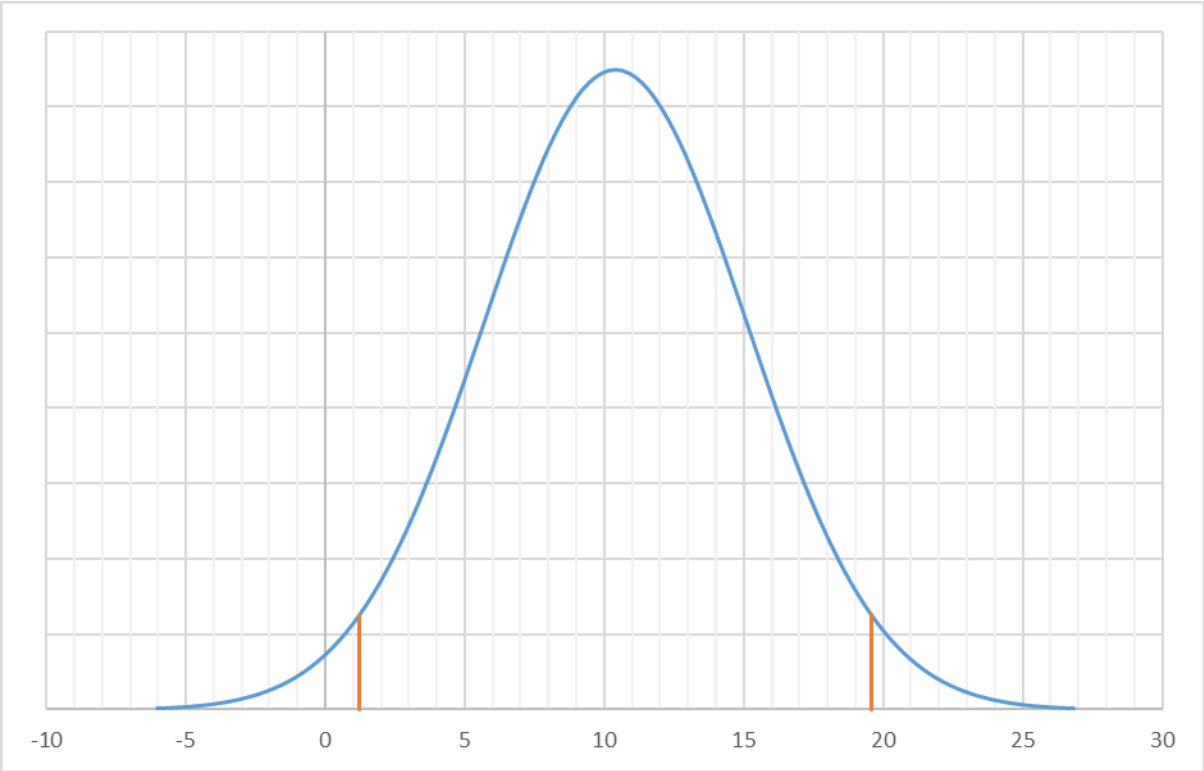
Solution

The z-scores associated with upper and lower 2.5% of data can be obtained from standard normal table or calculated using the technology (Excel function NORM.S.INV()). $z = \pm 1.96$

Lower endpoint = $\mu - z\sigma = 1.19$

Upper endpoint = $\mu + z\sigma = 19.61$

Central 95% of trees are expected to be between 1.19” and 19.61” diameter.



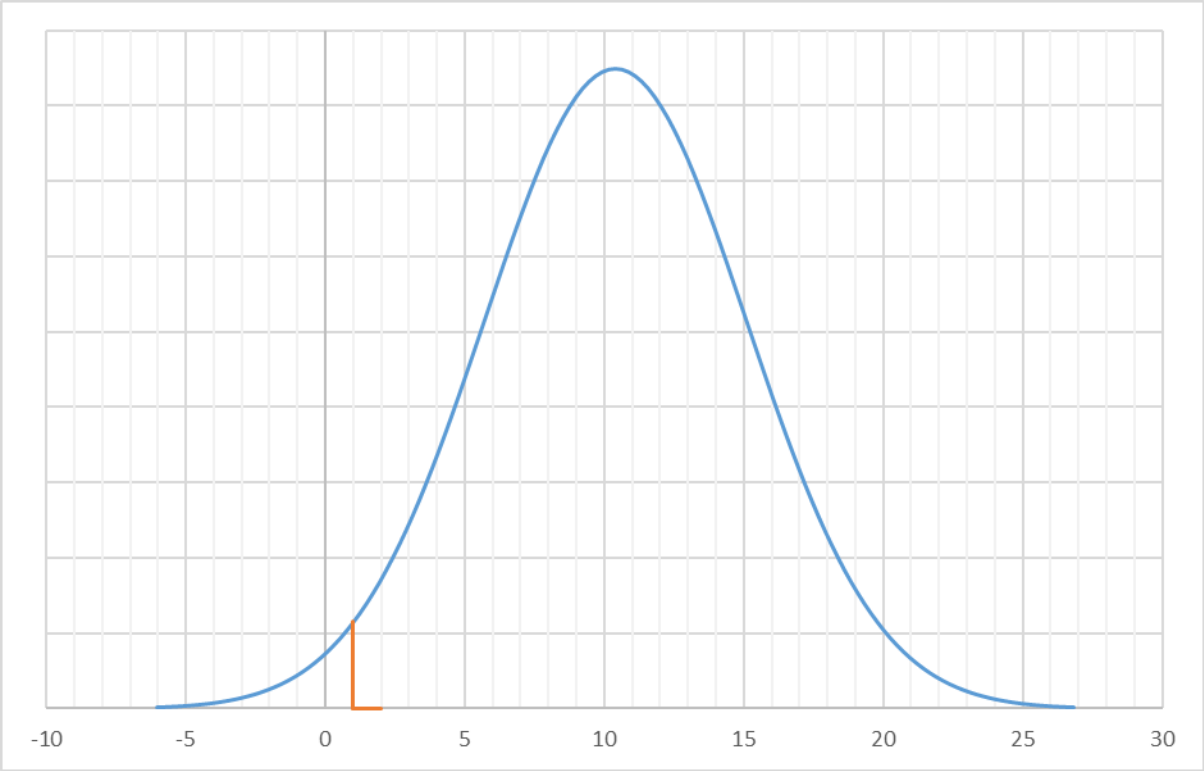
What percent of trees should be less than an inch in diameter?(diagram required)

Solution

The cumulative *p*-value associated with the given data score can be calculated using *z*-score and standard normal table, or using the technology (Excel function NORM.DIST()).

$p\ (x < 1) = 0.0228$

2.28% of trees are less than an inch in diameter.



What percent of trees should be between 4.9 and 10.4 inches.(diagram required)

Solution

$p(x_1 < x < x_2) = p(x < x_2) - p(x < x_1)$;

$p(x < 10.4) = 0.5$;

$p(x < 4.90) = 0.1210$;

$p(4.90 < x < 10.4) = 0.5 - 0.1210 = 0.3790$

37.90% of trees are between 4.9 and 10.4 inches.