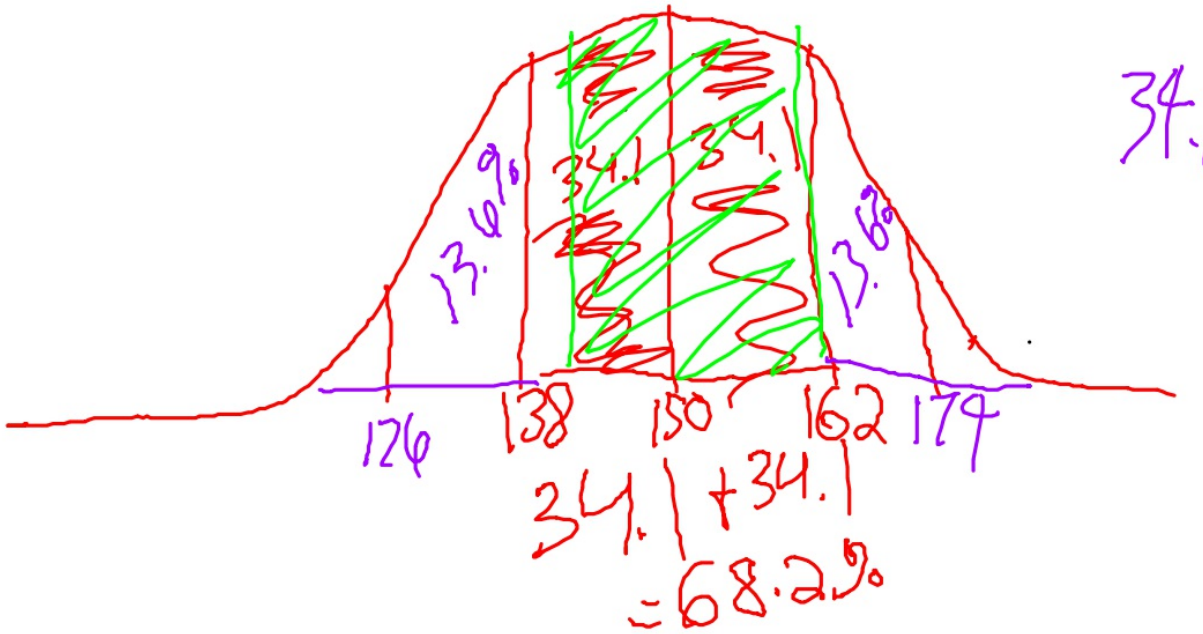
IB Math Studies 2 BELL WORK

Suppose $X \sim \mathrm{N}(150, 12^2)$. Find:

a $\mathrm{P}(138 \leqslant X \leqslant 162)$

b $\mathrm{P}(126 \leqslant X \leqslant 174)$



34.1+34.1+13.6+13.6

95.4%

Questions on the assignment?

Exercise 10 A # 2, 5, 7, 9

What kind of data is normally distributed?

Examples:

Continuous

height of a large population

weight

NonExamples:

discrete

When birthdays

small pop

Chapter 10

The normal distribution

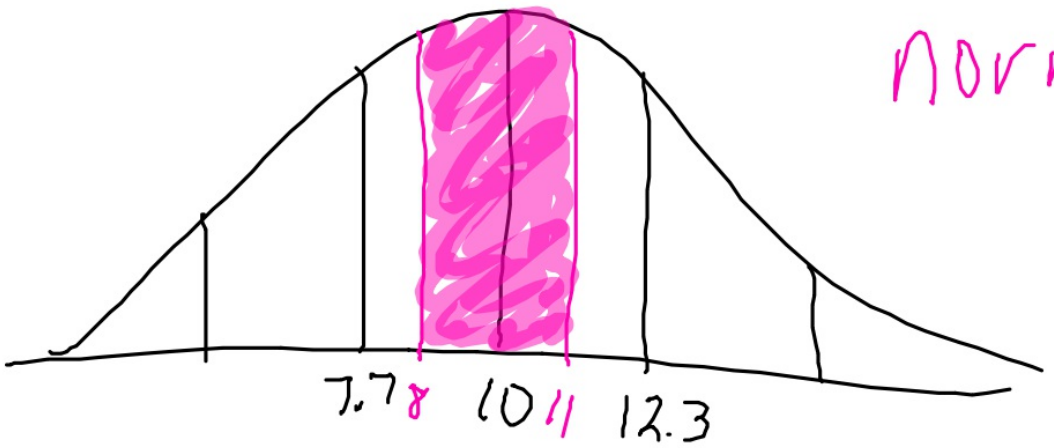
How do we calculate percentages from normal distributions using our calculator?

Topic 2: Descriptive Statistics

We know how to calculate normally distributed probabilities that begin and end *x* standard deviations from the mean, but what about general probabilities?

Suppose $X \sim \mathrm{N}(10, 2.3^2)$, so X is normally distributed with mean 10 and standard deviation 2.3.

How do we find $\mathrm{P}(8 \leqslant X \leqslant 11)$?



normal cDF
lower 8
upper 11
μ 10
σ 2.3

47.6%

What if we know the mean, the standard deviation, and the percent and want to know what number lies at that percent?

(pssst, we use a calculator)

Use normal CDF

when you know the data points and you want to know the prob/%

use inv Norm

when you know the % and want to find the data point

The weights of cabbages sold at a market are normally distributed with mean 1.6 kg and standard deviation 0.3 kg.

a One wholesaler buys the heaviest 10% of cabbages. What is the minimum weight cabbage he buys?

b Another buyer chooses cabbages with weights in the lower quartile. What is the heaviest cabbage this person buys?

(a)

invNorm
.90
1.6
0.3
1.98 kg

(b) invNorm 0.25
1.6
0.3
1.40 kg

Suppose $X \sim \mathrm{N}(30, 5^2)$ and $\mathrm{P}(X \leqslant a) = 0.57$.

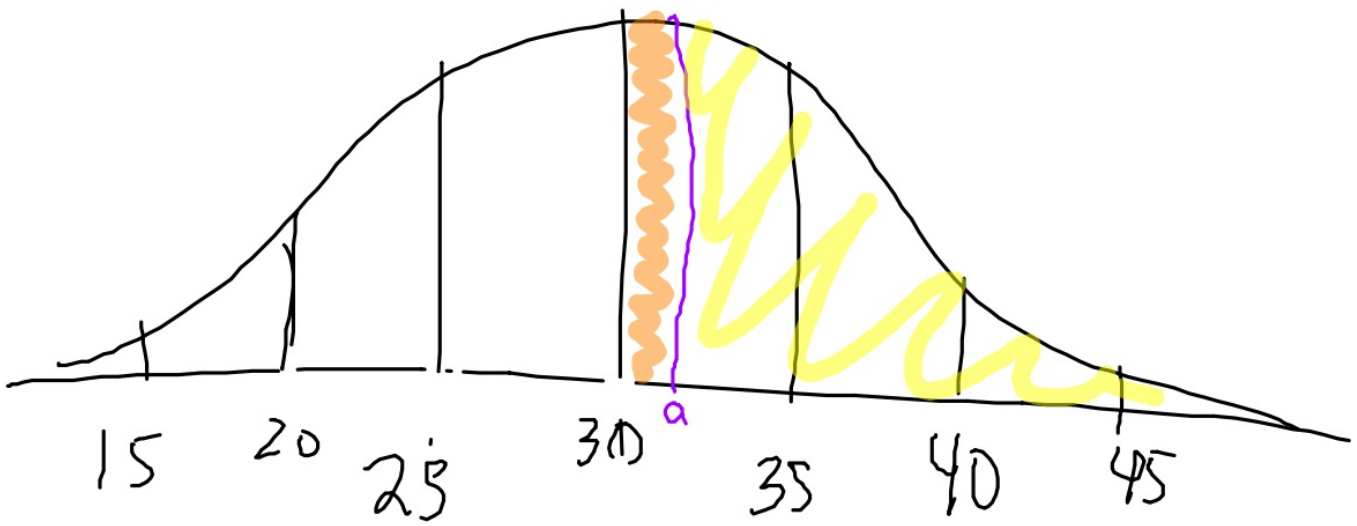
a Using a diagram, determine whether a is greater or less than 30.

b Use technology to find a. invNorm(.57, 30, 5) = 30.9

c Without using technology, find: **i** $\mathrm{P}(X \geqslant a)$ **ii** $\mathrm{P}(30 \leqslant X \leqslant a)$

43%

7%



Homework:

Exercise 10 B # 5, 7, 9