Normal Distributions WS 1 Name Key

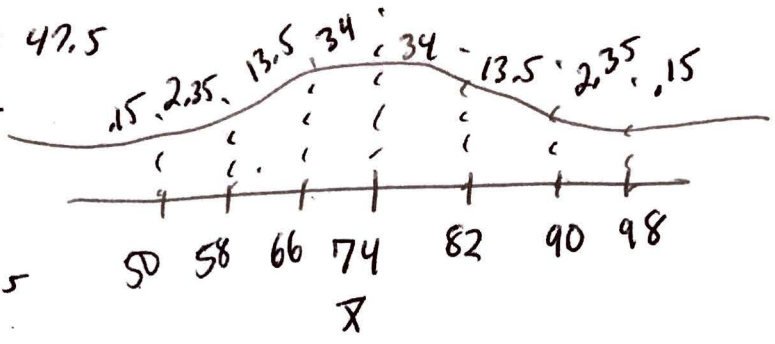
1) For a normally distributed set of data with mean 74 and standard deviation 8, find the following probabilities.

.475 a. P(58 ≤ x ≤ 74) 13.5 + 34 = 47.5

.775 b. P(66 ≤ x ≤ 90) 34 + 34 + 13.5

.025 c. P(x ≥ 90) 2.35 + .15

.84 d. P(x ≤ 82) .15 + 2.35 + 13.5 + 34 + 34



2) A normal distribution has a mean of 25 and a standard deviation of 5.

Find the percent of values are ...

a. between 20 and 30 34 + 34 = 68%

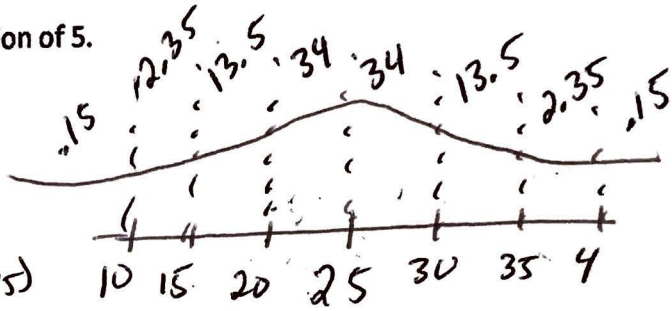
b. between 10 and 25 49.85%

c. at least 20 84% (34 + 34 + 13.5 + 2.35 + .15)

d. at most 30 84% (.15 + 2.35 + 13.5 + 34 + 34)

e. What values make up the middle 95%?

15 – 35



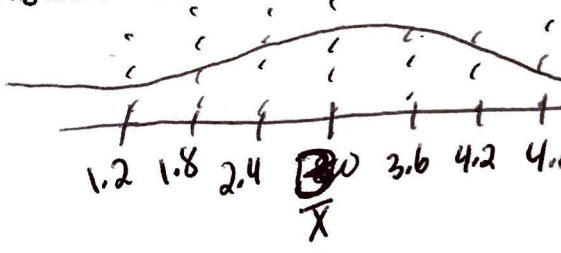
3) The weights of 1800 fish in a lake are normally distributed with a mean of 3 kg and a standard deviation of 0.6 kg.

a. About how many of the fish weigh 2.4 kg or more?

b. About how many of the fish weigh less than 1.8 kg?

c. About how many of the fish weigh between 2.4 kg and 4.2 kg?

d. About how many of the fish weigh between 1.8 kg and 4.8 kg?



4) A forester sampled 27 trees in a wooded area and found that the mean diameter of the trees is 15.4 inches with a standard deviation of 3.7 inches. Suppose that this sample of trees provides an accurate description of the entire forest and that the trees are normally distributed.

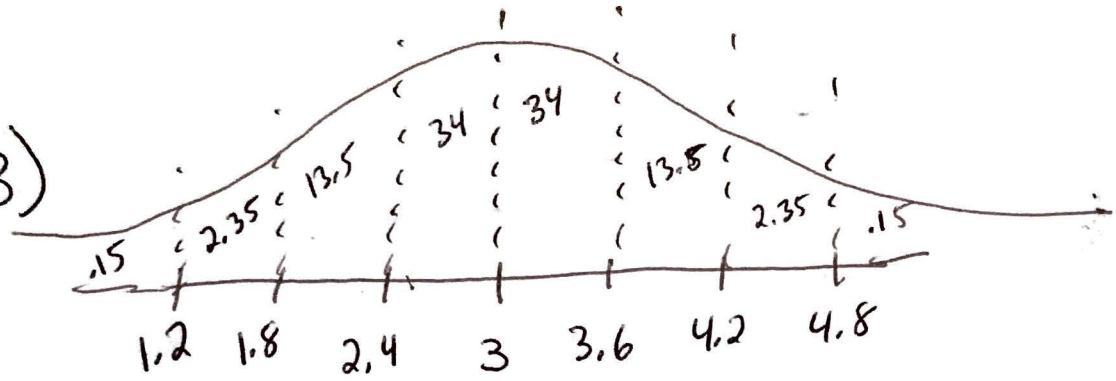
a. What is the range of diameters for the middle 95% of the trees in the forest?

b. What <u>percent</u> of the trees in the forest should be less than 8 inches in diameter?

c. What is the <u>probability</u> that a selected tree will be between 11.7 and 15.4 inches in diameter?

d. There are approximately 1540 trees in the forest. About <u>how many</u> trees are over 19.1 inches in diameter?

3)



a) $2.4 \rightarrow 34 + 34 + 13.5 + 2.35 + .15$

$= 84\%$

84% of 1800 fish $= .84(1800)$

$= \boxed{1512 \text{ fish}}$

b) less $1.8 \rightarrow .15 + 2.35$

$= 2.5\%$

2.5% of 1800 fish $= .025(1800)$

$= \boxed{45 \text{ fish}}$

c) $2.4 - 4.2 = 34 + 34 + 13.5$

$= 81.5\%$

81.5% of 1800 fish $= .815(1800)$

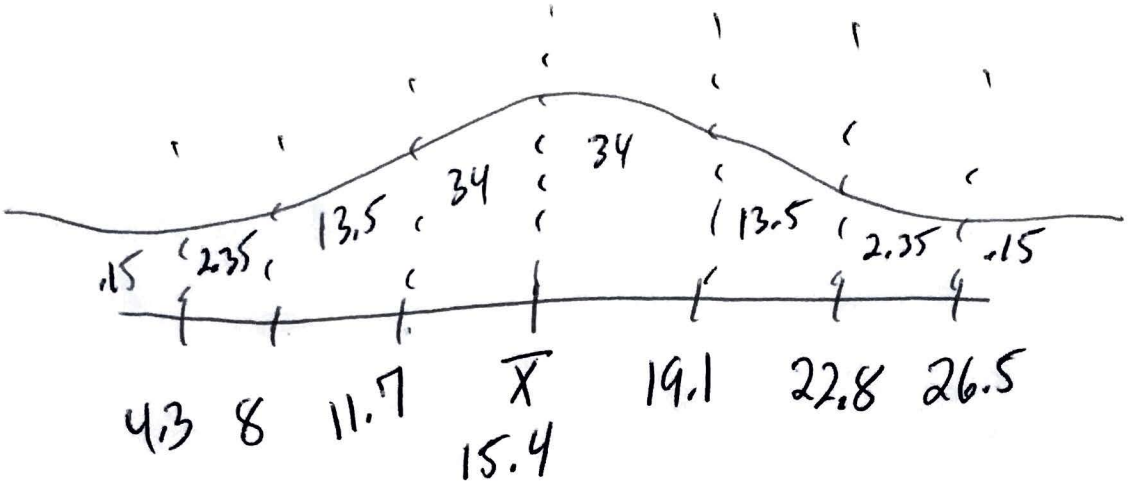
$= \boxed{1467 \text{ fish}}$

d) $1.8 - 4.8 = 13.5 + 34 + 34 + 13.5 + 2.35$

$= 97.35$

$.9735(1800) = \boxed{1752.3 \text{ fish}}$

4)



4.3 8 11.7 $\bar{X}$ 19.1 22.8 26.5

15.4

a) 8 – 22.8

b) 2.5 %

c) 34% → .34

d) 13.5 + 2.35 + .15 = 16%

16% of 1540 trees = .16 (1540)

= 246 trees