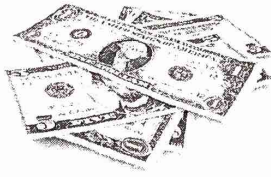


Name: _____ Hour: _____ Date: _____

Lesson 6.1: Day 2: How much do you get paid?



Suppose you got a new job and each day your boss (Mrs. Gallas) draws a slip of paper from a bag to determine your wage for the day. Let the random variable X = daily wage (\$ per hour).

1. What is your wage for the day? _____ Add your data to the table on the board and complete the table below.

Example:

X	1	5	7	10	15	25
Probability	5/22	2/22	10/22	3/22	0/22	2/22

2. Calculate and interpret the expected value of X .

$\bar{x} = 7.5$, If we draw many many wages, the average wage is about \$7.50

3. Recall from chapter 1 that standard deviation tells us the typical distance from the mean. Complete the table to calculate the standard deviation for the probability distribution.

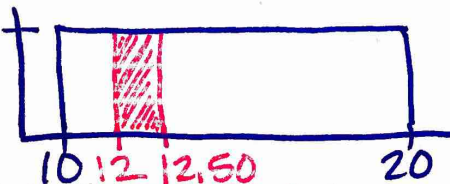
Value	Distance from mean	(Distance from mean) ²	Weighted (Distance from the mean) ²
1	-6.5	42.25	9.60
5	-2.5	6.25	.568
7	-1.5	.25	.114
10	2.5	6.25	.852
15	7.5	56.25	0
25	17.5	306.25	27.8
Total =			38.934
SD =			6.24

4. Interpret the standard deviation.

The wages typically vary by \$6.24 from the mean of \$7.50.

5. Mrs. Gallas decides she would rather assign wages so that employees could get any amount from \$10 to \$20 and all are equally likely. Draw a graph to represent this probability distribution.

Uniform Distribution




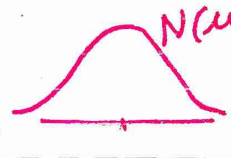
6. What is the probability that an employee makes between \$12 and \$12.50?

Width = $12.50 - 12 = 0.50$ Prob = $0.50 \times \frac{1}{10}$
 Height = $\frac{1}{10}$ = 0.05

Answers will vary.

$$\sigma = \sqrt{\sum (x_i - \mu)^2 p_i}$$

Lesson 6.1 Day 2- Probability and Continuous Random Variables

<p>Important ideas: LT#1 Standard Deviation of a Discrete prob. dist. $\sigma = \sqrt{\sum (x_i - \mu)^2 \cdot p_i}$ $\sigma^2 = \text{variance}$</p>	<p>LT#2 Probability for continuous random variables. Find area under curve: Uniform Normal   $Z = \frac{x - \mu}{\sigma}$ Table A or normal cdf</p>
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Check Your Understanding

The heights of young women can be modeled by a Normal distribution with mean $\mu = 64$ inches and standard deviation $\sigma = 2.7$ inches. Suppose we choose a young woman at random and let $Y =$ her height (in inches).

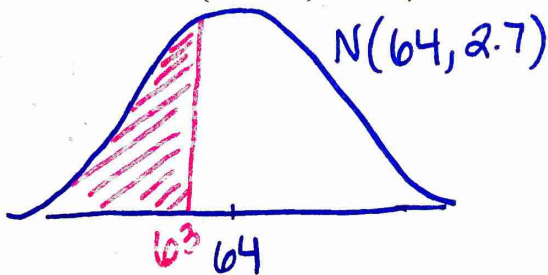
1. What type of variable is Y , discrete or continuous? Explain.

Continuous, all heights are possible.

2. Interpret the standard deviation.

The heights typically vary by 2.7 in from the mean height of 64 in.

3. Find $P(Y \leq 63)$. Interpret this value.



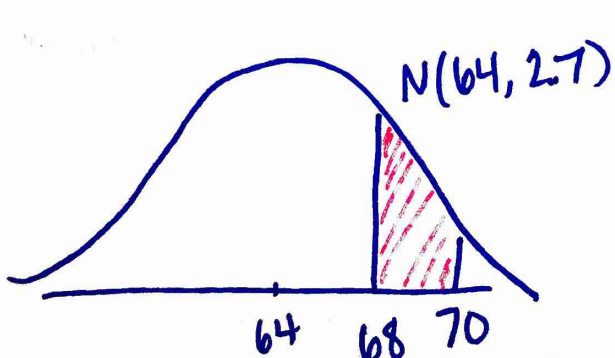
$$Z = \frac{Y - \mu}{\sigma}$$

$$Z = \frac{63 - 64}{2.7}$$

$$= -.37 \xrightarrow{\text{Table A}}$$

"There is a prob. of .3557 that a randomly selected female is less than or equal to 63 in."

4. Find $P(68 \leq Y \leq 70)$. Interpret this value.



$$Z = \frac{70 - 64}{2.7} = 2.22 \rightarrow .9868$$

$$Z = \frac{68 - 64}{2.7} = 1.48 \rightarrow .9306$$

$$.0562$$

There is a .0562 prob. that a randomly selected female is between 68 to 70 in.