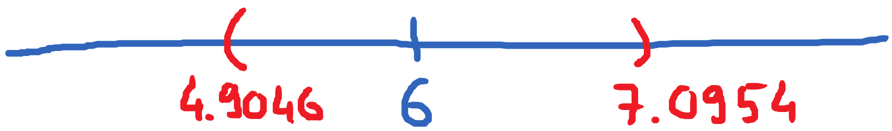
Final Review

Wednesday, May 2, 2018 12:33 PM

(1) Mean $= 6$

Standard Deviation ≈ 1.0954



☒ L $\longrightarrow$ 8 numbers belong to the interval.

$n = 10$

$\longrightarrow$ % of data lies within 1 SD. of Mean

$$= \frac{8}{10} = \boxed{80\%}$$

(2) Range $= \$387 - \$128 = \boxed{\$259}$

$q = 0.58$

(3) X = # of hits ; $n = 4$; $p = 0.42$; Binomial

$$P(X \geq 2) = 1 - [\underbrace{P(X=0)} + \underbrace{P(X=1)}]$$

Wednesday, May 2, 2018 12:44 PM

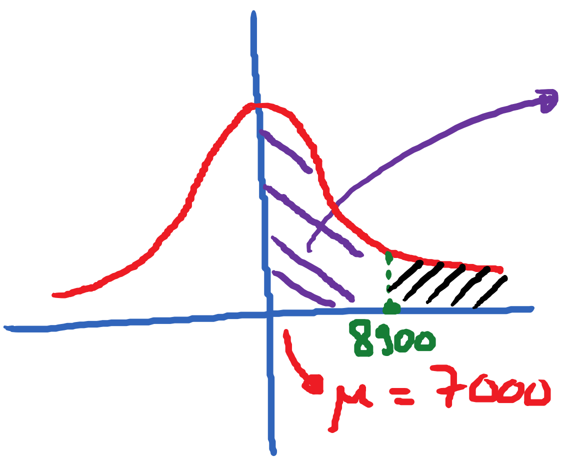
$$P(X=0) = C(4,0)\cdot(0.42)^0\cdot(0.58)^4$$
$$\approx 0.1131$$

$$P(X=1) = C(4,1)\cdot(0.42)^1\cdot(0.58)^3$$
$$\approx 0.3278$$

$$P(X \geq 2) = 1 - [0.1131 + 0.3278]$$
$$\approx \boxed{0.5591}$$

④ z-score of $134.9 = \dfrac{134.9 - 120}{5} \approx \boxed{2.98}$

⑤ $P(X > 8{,}900) = 0.5 - 0.4713 \approx \boxed{0.0287}$



$$P(\boxed{7000} < x < \boxed{8900})$$

$7000 \to 0$

$8900 \to \dfrac{8900 - 7000}{1000} = 1.9$

$= \text{normalcdf}(0, 1.9)$

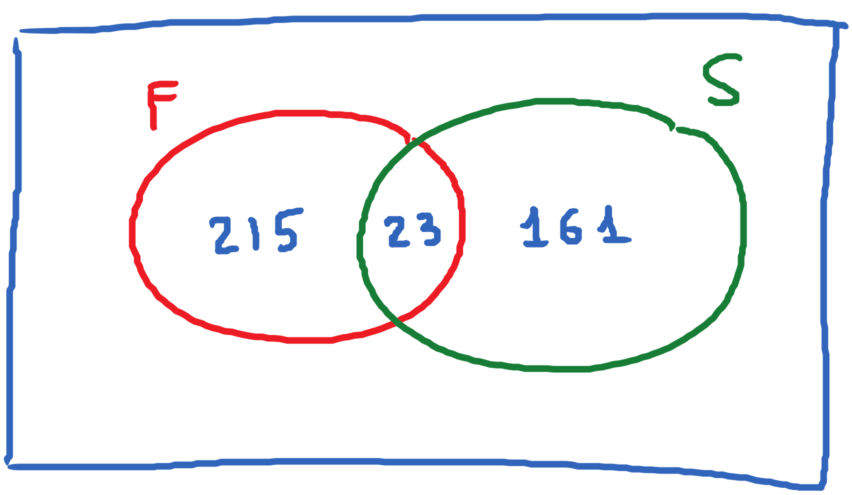
≈ 0.4713

(6) $$\underbrace{C(8,4)\cdot 9}_{\text{\# of ways to choose 4 tech reps and 1 sales rep}} + \underbrace{C(8,5)}_{\text{\# of ways to choose 5 tech reps}} = \boxed{686}$$

(7) $$P(F|E') = \frac{P(F\cap E')}{P(E')} = \frac{n(F\cap E')}{n(E')}$$

$$= \frac{468}{1492} = \boxed{\frac{117}{373}}$$

(8)



\# of students who take Finite but not Stats

$= \boxed{215}$

Wednesday, May 2, 2018 1:02 PM

9. $$PMT = FV\left(\frac{i}{(1+i)^{n} - 1}\right)$$

$i = \frac{R}{m}$ → compounding frequency

$n = m \cdot t$

$$= 410{,}000\left(\frac{\frac{0.06}{2}}{\left(1+\frac{0.06}{2}\right)^{21\cdot 2} - 1}\right)$$

$$= \boxed{\$4998.586}$$

10. $$PMT = PV \cdot \left(\frac{i}{1-(1+i)^{-n}}\right)$$

$$= \$70{,}000 \cdot \left(\frac{\frac{0.12}{12}}{1-\left(1+\frac{0.12}{12}\right)^{-(12\cdot 15)}}\right)$$

$$\approx \$840.118$$

11

Midpoint	Freq	$(x_i - \mu)^2$
54.5	8	361
64.5	7	81
74.5	12	1
84.5	7	121
94.5	6	441

$$\text{Mean} = \frac{\sum x_i \cdot f_i}{n} = 73.5$$

$$\text{Variance} = \frac{\sum (x_i - \mu)^2 \cdot f_i}{n} = 174$$

$$\text{S.D.} = \sqrt{\text{Variance}} = \sqrt{174} \approx 13.19 \rightarrow \text{population S.D.}$$

$$\text{Sample S.D.} \longrightarrow \sqrt{\frac{\sum (x_i - \mu)^2 \cdot f_i}{n-1}} \approx 13.36$$

Sample S.D.

12 Binomial Distribution. $n = 10$; $p = 0.33$.

$$P(X \leq 6) = 1 - [P(X=7) + P(X=8) + P(X=9) + P(X=10)]$$

$P(X=7) = C(10,7)\cdot(0.33)^7\cdot(0.67)^3$

$P(X=8) = C(10,8)\cdot(0.33)^8\cdot(0.67)^2$

$P(X=9) = C(10,9)\cdot(0.33)^9\cdot(0.67)^1$

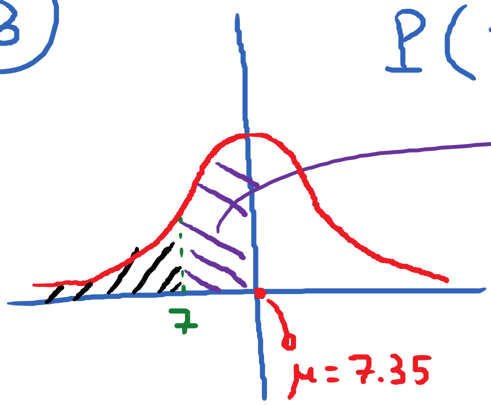
$P(X=10) = C(10,10)\cdot(0.33)^{10}\cdot(0.67)^0$

$P(X \le 6) \approx 0.9815$

$0.5 - 0.3413 \approx \boxed{0.159}$

13

$P(X<7) = 0.5 - P(7<X<7.35)$



$P(\boxed{7} < X < \boxed{7.35})$

$\frac{7-7.35}{0.35} = -1$ $\qquad$ 0

$= \text{normalcdf}(-1, 0) \approx 0.3413$

Wednesday, May 2, 2018 1:29 PM

14 Mode = 2

15 Binomial, $n = 6$; $p = 0.42$; $q = 0.58$

a $p(x) = C(6,x) \cdot (0.42)^{x} \cdot (0.58)^{6-x}$

b $P(X \geq 3) = 1 - [P(X=0) + P(X=1) + P(X=2)]$

$P(X=0) = C(6,0) \cdot (0.42)^{0} \cdot (0.58)^{6}$

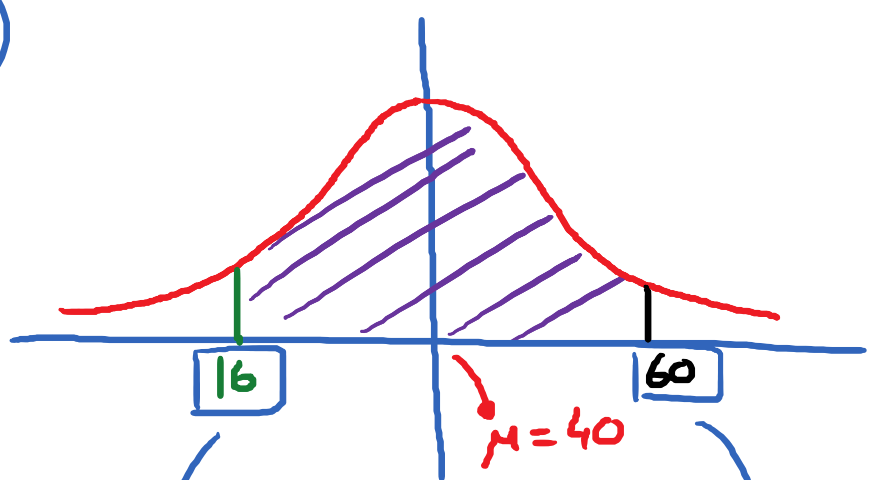
$P(X=1) = C(6,1)(0.42)^{1} \cdot (0.58)^{5}$

$P(X=2) = C(6,2)(0.42)^{2} \cdot (0.58)^{4}$

$P(X \geq 3) \approx \boxed{0.497}$

Wednesday, May 2, 2018 1:33 PM

16



$$z\text{-score} = \frac{16-40}{16} \approx -1.5$$

$$z\text{-score} = \frac{60-40}{16} = 1.25$$

$\longrightarrow$ normalcdf $(-1.5, 1.25) \approx 0.8275.$

17 $\longrightarrow$ Easy.

18

	Rain	Does not Rain
prob	0.34	0.66
profit	180,000	270,000

$$\text{Expected Profit} = (180{,}000)\cdot(0.34) + (270{,}000)(0.66)$$
$$\approx \boxed{239{,}400}$$

19 First 4 years:

$$FV = PMT\left(\frac{(1+i)^n - 1}{i}\right)$$

$$= \$100 \cdot \left(\frac{\left(1 + \frac{0.06}{4}\right)^{16} - 1}{\frac{0.06}{4}}\right)$$

$$\approx \boxed{\$1793.24}$$

last 1 year

$$A = P(1+i)^n$$

$$A = (1793.24) \cdot \left(1 + \frac{0.075}{2}\right)^2$$

$$\approx \boxed{\$1930.25}$$