

STT 200 5:30 1-25-10 EXAM 1 WED 2-3-10

Note Title

1/25/2010

TODAY - 40 MINUTE QUIZ - I WILL GO OVER SOLUTIONS
AFTERWARD.
CH 15-17

#4. IF $P(B|A) = 0.4$ \leftarrow NOT 0.2

#16. a) (400, 400) b) (400, 900) c) (604, 20)
d) (400, 30) e) (400, 60)

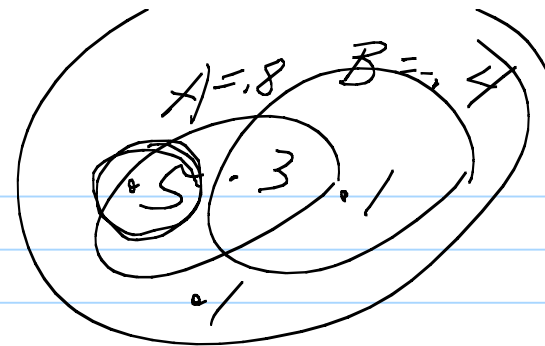
#17. RULE OF THUMB FOR MEAN \pm 2 STD DEVIATIONS

GO TO TIME 6:05

1. S. GIVEN $P(A) = 0.8$ $P(B) = 0.4$

1. $P(A \cap B) = 0.3$

$P(A \cup B) \stackrel{\text{Venn}}{=} .5 + .3 + .1 = .9$ (a)



OR ADDⁿ Rule $P(A \cup B) \stackrel{\text{RULE}}{=} P(A) + P(B) - P(A \cap B) = .8 + .4 - .3$

2. $P(A \cap B) = .3$ then $P(B|A) \stackrel{\text{DEF}}{=} \frac{P(A \cap B)}{P(A)} = \frac{.3}{.8} = .375$ (d)
IF \swarrow CONDITIONING EVENT \uparrow

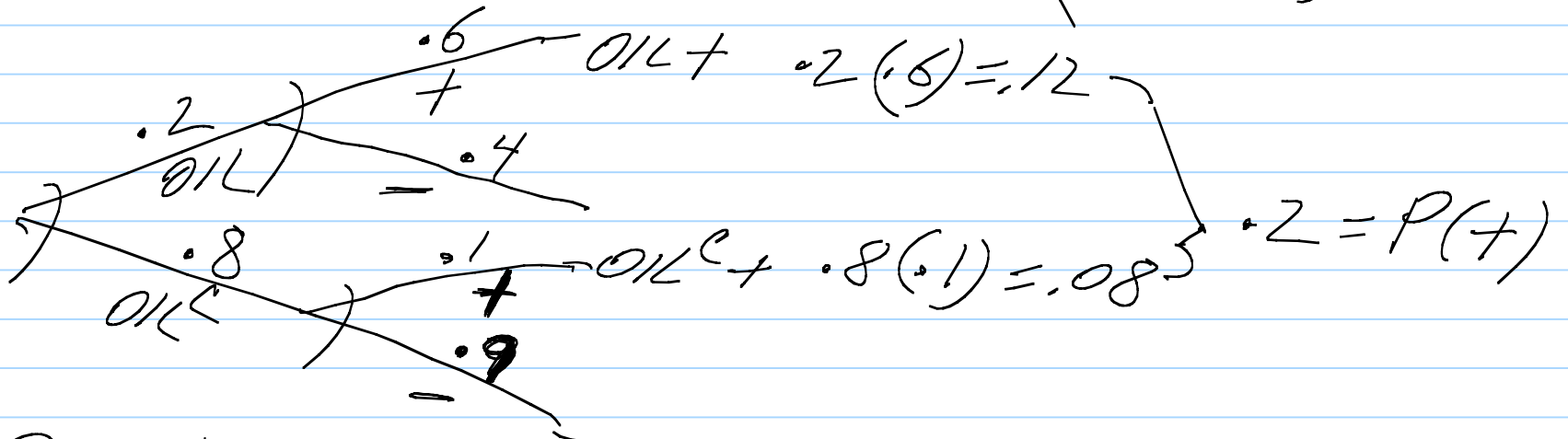
3. $P(A \cap B) = .3$ then $P(A \cap B^c) \stackrel{\text{Venn}}{=} .5$

(THINK!) $P(A) - P(A \cap B) = .8 - .3 = .5$ (e)

4. $P(B|A) = 0.4$ then $P(A \cap B) \stackrel{\text{MULT}}{\text{RULE}} P(A)P(B|A) = .8(.4) = .32$ (b)

5. IF A, B ARE INDEPENDENT $P(B|A) = P(B) = .4$ (c)

6-10



6. $P(+|OIL) = .6$ NOTATIONAL CONVENTION (a)

7. $P(OIL+)$ MULT AND $= P(OIL)P(+|OIL) = .2 \cdot .6 = .12$
 $P(OIL) P(+|OIL)$

8. $P(+)$ = .2 SEE ABOVE

$$9. P(OIL | +) \stackrel{DEF}{=} P(OIL +) / P(+)$$

BAYES-

10. Spree COST TO TEST IS 30
COST DRILL IS 100

GROSS FROM OIL 1000

NET AT CONTINGENCY

OIL^C+

$$-30 - 100 + 0 \quad (b)$$

11-13

x $P(x)$
0 .4

x $P(x)$
0

$x^2 P(x)$
 $0^2 \cdot .5 = 0$

TEST POS TEST NO OIL

1 .2

.2

$1^2 \cdot .2 = .2$

$EX = 1 \quad (a)$

2 .4

.8

$2^2 \cdot .4 = 1.6$

$1 = EX$

$1.8 = EX^2$

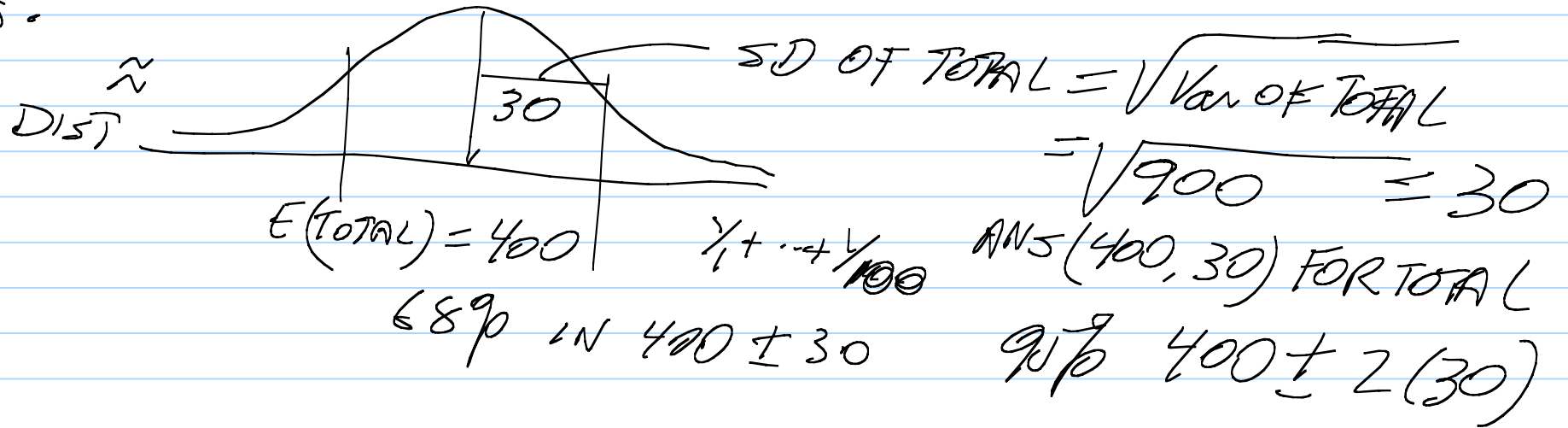
$$55 \text{ VARIANCE OF } X = EX^2 - (EX)^2 = 1.8 - 1^2 = 0.8 \quad (c)$$

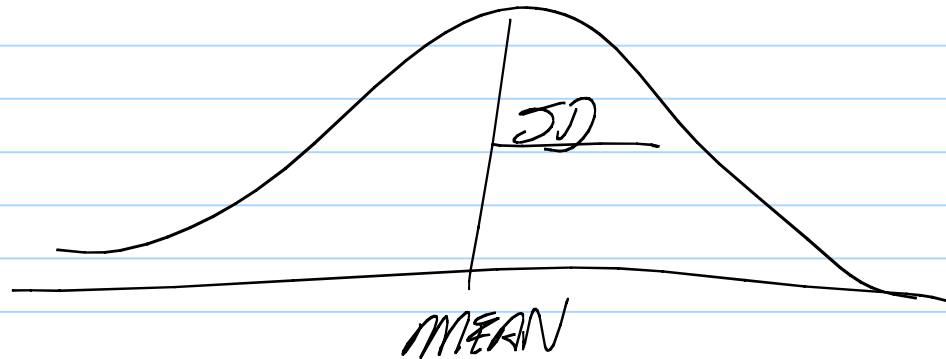
14-16 ONE PLAY Y (RANDOMLY) $EY = 4$

14. $E(\text{TOTAL } Y_1 + \dots + Y_{100} \text{ INDEPENDENT PLAYS})$ Variance $Y = 9$ (STD DEV = 3)
 $= 100 EY = 100(4) = 400$

15. Variance $(Y_1 + \dots + Y_{100}) \stackrel{\text{INDEP}}{=} 100 \text{ Variance of } Y = 100(9) = 900$

16.





68% IN MEAN \pm SD
95% IN MEAN \pm 2 (SD)