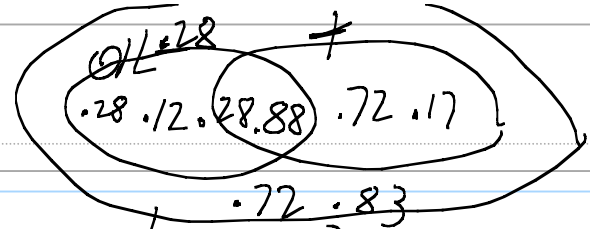


STT 200 1.1 - 30 - 09



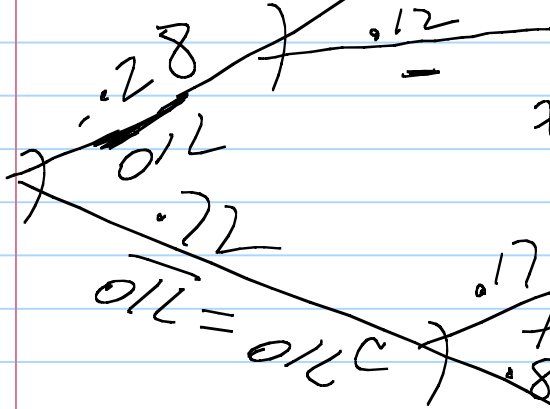
#6. GIVEN $P(OIL) = .28$ $P(+ | OIL) = .88$

$\text{COST TEST} = 80$
 $\text{DRILL} = 900$
 $\text{REWARD FROM OIL} = 3000$

$P(+ | OIL^c) = .17$
 IF

$x = \text{NET FROM}$
POLICY II:
 TEST BUT DRILL
 ONLY IF TEST +

$OIL + = P(OIL) P(+ | OIL) = .28(.88)$
 $x = -80 - 900 + 3000 = 2020$



$OIL - .28 .12$
 $x = -80 - 0 + 0 = -80$

$OIL^c + .72 .17$
 $x = -80 - 900 + 0 = -980$

$OIL^c - .72 .83$
 $x = -80 - 0 + 0 = -80$

$E(\text{NET I})$
 $= .28(-900 + 3000) + .72(-80)$
 $= 2100(.28) - 57.6$
 $= 586.4$

$E(\text{NET II}) = \sum x P(x)$
 $= 2020(.28)(.88) - 80(.28)(.12) - 980(.72)(.17) - 80(.72)(.83)$
 $= 327.28$

#4. GAME A HAS NET RETURN ON \$1, X $E X = \$(-.035)$
 $SD X = \sigma_X = \$3.65$
 GAME B " " " " " Y $E Y = \$(-.024)$
 $\sigma_Y = \$4.11$

PLAY 100 TIMES (A): INDEP PLAYS X_1, X_2, \dots, X_{100}

NETS $X_1 + \dots + X_{100}$

INDEP OF THIS

PLAY 400 TIMES (B): INDEP PLAYS $Y_1 + \dots + Y_{400}$

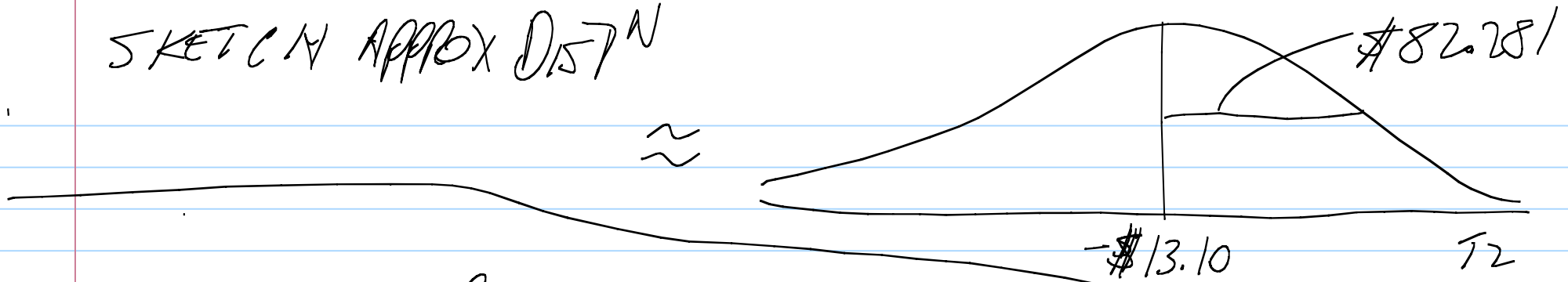
NETS $X_1 + \dots + X_{100} + Y_1 + \dots + Y_{400}$ TOTAL T_2

$$E T_2 \stackrel{\text{ADDN}}{=} 100 E X + 400 E Y = \$100(-.035) + 400(-.024) = -13.1$$

$$\text{Var } T_2 \stackrel{\text{INDEP}}{=} 100 \text{Var } X + 400 \text{Var } Y = 100 (3.65)^2 + 400 (4.11)^2$$

$$\sigma_{T_2} = \sqrt{\text{Var } T_2} = \sqrt{100 (3.65)^2 + 400 (4.11)^2} = \$89.967$$

SKETCH AN APPROX DIST^N



ALTERNATIVE PLAY T1: PUT \$100 TO SINGLE PLAY OF X
 PUT \$400 TO " " " Y

$$T1 = 100X + 400Y$$

X indep of Y

$$E T1 = 100 E X + 400 E Y = 100(-.035) + 400(-.024) = -13.1$$

BUT

$$\text{Var } T1 = \text{Var}(100X + 400Y) \stackrel{\text{INDEP}}{=} \text{Var}(100X) + \text{Var}(400Y)$$

$$100^2 \text{Var } X + 400^2 \text{Var } Y$$

$$\sigma_{T1} = \sqrt{\text{Var } T1} = \sqrt{100^2 3.65^2 + 400^2 4.11^2} = 1684.03$$

LARGER SD FOR T1.
 ALSO NO BELL CURVE

#1 3 DOORS PROBLEM ("LET'S MAKE A DEAL")

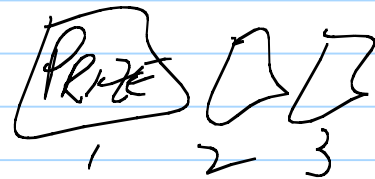
PRIZE BEHIND ONE OF 3 DOORS.

HOST: INVITES YOU TO CHOOSE A DOOR. YOU DO
HOST SHOWS A DOOR (NOT YOURS) HAS NOTHING BEHIND IT.
HOST OFFERS TO LET YOU SWITCH TO THAT DOOR (NOT YOURS) STILL IN PLAY.

YOU (CONTESTANT) CAN CHOOSE A DOOR W/ EQUAL PROBABILITY FOR ALL.

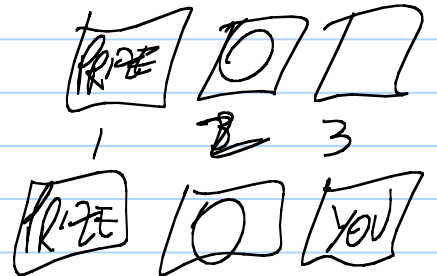
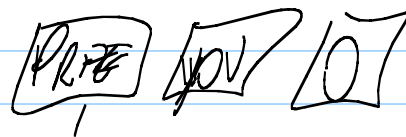
I SAY WE MAY AS WELL TAKE MODEL

$$P(\text{KEEP WINS}) = P(\text{SELECT \#1}) = \frac{1}{3}$$



$P(\text{SWITCH WINS})$

$$= 1 - P(\text{KEEP WINS}) = 1 - \frac{1}{3} = \frac{2}{3}$$



PR MODEL

YOU CHOOSE

1
2
3

PRIZE

10

□

SWITCHER

3

WIN

$P(\text{SWITCHER WINS})$

2 → 3

WIN

$= \frac{2}{3}$

lose

3

LOSE

~~MARILYN VOS SAVANT~~

#3. $EW = 41.7$ $\sigma_x = 17.2$ DISP^N OF W IS NOT KNOWN

$$E(3W+2) = 3EW + 2 = 3(41.7) + 2$$

$$\text{Var}(3W+2) = 9 \text{Var} W$$

$$\begin{aligned} \text{Var} W &= E(W - EW)^2 \\ \sigma_W &= \sqrt{E(W - EW)^2} \\ \sigma_W &= \sqrt{EW^2 - (EW)^2} \end{aligned}$$