30, 35, 70 = .2, .5, .3

(30,30) (35,30)

(30,35)

(35,35)

(35,70) (70,35)

(70,70)

(70,30)

(30,70)

HW Q's

#1) find sample distributions

(35,35) ~ $\bar{x}$ = 35

(35,40) ~ 37.5

(40,40) $\bar{x}$ = 40

(40,65) = 52.5

(65,40)

(65,65) = 65

(65,35) = 50

(35,65)

35	37.5	40	50	52.5	65

2 P(35) · P(40)

2 (.2)(.5)

= .20

b) s^2 add $\frac{\text{dev's}^2}{n-1}$

3) sample size = ?

X ~> μ_x = 5

σ_x = 4

T = ?

total time? sum of all x_i's

a)

$\bar{x}$	30	32.5	35	50	52.5	70
$p(\bar{x})$	.04	.2	.25	.	.3	.09

(30,30)

(.2 * .2)

2 P(30,35)

2 (.20)(.50)

=

.5 * .5

2P(35,70)

2(.5,.3)

.3 * .3

b)

.04 * 30 + ... = 44.5

d)

s^2	0	12.5	612.5	800
$p(s^2)$				

30 = .2

35 = .5

70 = .3

30 - 44.5 → -14.5 = 210.25

35 - 44.5 → -9.5 += 90.25

70 - 44.5 → 25.5 += 650.25

= 950.75

X_1	X_2	$\bar{X}$	P	σ^2
30	30	30	.04	$(30-30)^2+(30-30)^2 = 0$
30	35	32.5	.10	$(30-32.5)^2+(35-32.5)^2 = 12.5$ (6.25 + 6.25)
30	70	50	.06	$(30-50)^2+(70-50)^2 = 800$
35	30	32.5	.10	$(35-32.5)^2+(30-32.5)^2 = 12.50$
35	35	35	.25	$(35-35)^2+(35-35)^2 = 0$
35	70	52.5	.15	$(35-52.5)^2+(70-52.5)^2 = 612.50$
70	30	50	.06	$(30-50)^2+(70-50)^2 = 800$
70	35	52.5	.15	$(70-52.5)^2 * 2 = 612.50$
70	70	70	.09	0

$(X_1-\bar{X})^2+(X_2-\bar{X})^2$
if $X_1 = X_2$
$= 0$
if $X_1 \neq X_2$
$2(X_1-\bar{X})^2$

3	0's
2	612.50
2	800
2	12.50

3*
2 * .15
2 * .06
2 * .10

---

2 a) $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

mean = 70

$\sigma_{\bar{x}} = \frac{1.6}{8}$

$\mu_{Total} = n \cdot \mu_x$ ← mean of population

$\sigma_T = \sigma\sqrt{n}$

b) mean = 70

$\sigma_{\bar{x}} = \frac{1.6}{16}$

$\mu_x = \mu$

$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

---

3) 45 students

grade random test = 5 mins

4 standard dev

---

a)

$n = 45$

$45 \cdot 5 = 225$ mins

$P(X < 250\text{ m})$

$250 - 225$

$\sigma = 4$

4

generally $n \geq 30$ = large enough

$n = 45$

$\mu_T = \mu_x n = 5 * 45 = 225$

$\sigma_T = \sigma_x \sqrt{n} = 4 * \sqrt{45} = 26.83281573$

$\frac{250 - 225}{4\sqrt{45}}$

$= .9316949906$

$\sim .9317$

$P(z < .9317)$

$\Phi .9317 = .8238$

---

b) $n = 45$

$\mu = 5$

$\sigma = 4$

$\mu_T = \mu_x n = 5 * 45 = 225$

$\sigma_T = \sigma_x \sqrt{n} = 26.83281573$

$P(X > 260)$ → value

$P\left(\frac{260 - 225}{26.83281573}\right)$

$P(1.304372998687475)$

.9032

$P\left(\frac{\text{value} - \mu_T}{\sigma_T}\right)$

---

4 a) + skewed

B) $n = 60$

$\mu_x = 115$

$\sigma_x = 110$

$P(100 < \bar{x} < 125)$

$\mu_T = \mu_x n = 115 * 60$

$\sigma_T = \sigma_x \sqrt{n} = 110 * \sqrt{60}$

$110 \rightarrow$ new $11/6$

$115 \rightarrow \frac{115 * 60}{60} =$ new mean

$\frac{100 - 115}{\frac{110}{\sqrt{60}}} = -1.06$ } SS DEV.

.1446

$\frac{125 - 115}{\frac{110}{\sqrt{60}}} = .70$

.7580

$= .6134$

$\frac{140 - 115}{\frac{11}{6}\sqrt{60}} = 1.76$

.0392