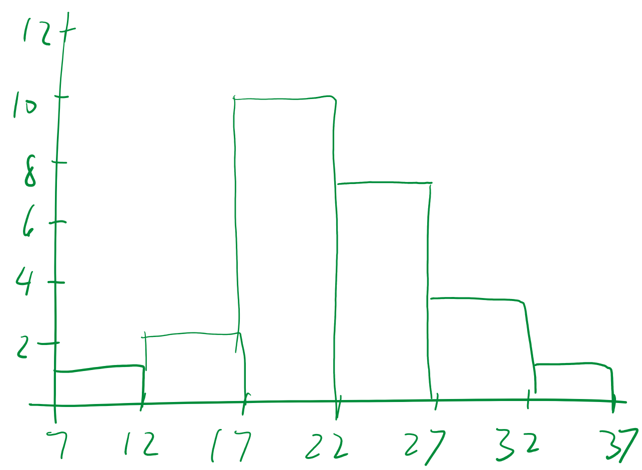
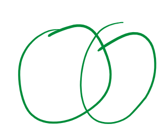
6a.

Cents	Frequency
7.0 – 11.9	1
12.0 – 16.9	2
17.0 – 21.9	10
22.0 – 26.9	7
27.0 – 31.9	4
32.0 – 36.9	1

b.



11. P(non-face or diamond)



$= P(\text{non-face}) + P(\text{diamond}) - P(\text{non-face and diamond})$

$= \frac{40}{52} + \frac{13}{52} - \frac{10}{52}$

$= \boxed{\frac{43}{52}}$ or $\approx \boxed{0.83}$

12.

			Lemon-line
Under 21 years	45	25	25
			30
			35

$P(\text{under 21 years} \mid \text{Lemon-line})$ $\leftarrow$ $\frac{\cap}{RHS}$ $\frac{25}{}$ $\leftarrow 25+30+35=90$

$= \frac{25}{90}$

$\approx \boxed{0.28}$

$7 \overset{?}{<} 7$

9. $P(\text{less than } 7) = P(1-6, \cancel{7})$

$= \frac{1,2,3,4,5,6}{12}$

$= \frac{6}{12}$

$= \boxed{\frac{1}{2}}$ or $\boxed{0.5}$

II. Prob. Dist's parameters $\leftarrow$ for measurement

i. mean

$\boxed{\mu = \sum [x\, p(x)]}$ $\leftarrow \sum x_i \cdot P(x_i)$

$\leftarrow x_1 P(x_1) + x_2 P(x_2) + \ldots$

$$\boxed{\mu = \sum[x\,p(x)]} \longleftarrow x_1 p(x_1) + x_2 p(x_2) + \cdots + x_n p(x_n)$$

The mean μ is for the probability distribution, only.

ii standard deviation $\longleftarrow$ only the calculation

$\longleftarrow$ how far away from the mean

variance: $\sigma^2 = \sum(x-\mu)^2 p(x)$

std. dev. $\boxed{\sigma = \sqrt{\sum(x-\mu)^2 p(x)}}$

eg. The following describe a real probability distribution for the number of girls in two births. Find the mean and the standard deviation.

	x	$p(x)$
$x_1 \rightarrow$	0	0.25
$x_2 \rightarrow$	1	0.5
$x_3 \rightarrow$	2	0.25

S:

$$\mu = \sum x\,p(x)$$

$$= 0\cdot 0.25 + 1\cdot 0.5 + 2\cdot 0.25$$

$$= 0 + 0.5 + 0.5$$

$$= \boxed{1} \text{ girl}$$

$$\sigma = \sqrt{\sum(x-\mu)^2 p(x)}$$

$$\sigma = \sqrt{\sum (x-\mu)^2 p(x)}$$

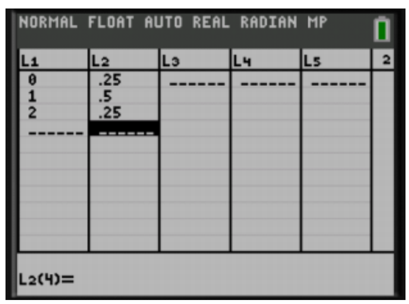
$$= \sqrt{(0-1)^2 \cdot 0.25 + (1-1)^2 \cdot 0.5 + (2-1)^2 \cdot 0.25}$$

$$= \sqrt{1 \cdot 0.25 + 0 \cdot 0.5 + 1 \cdot 0.25}$$

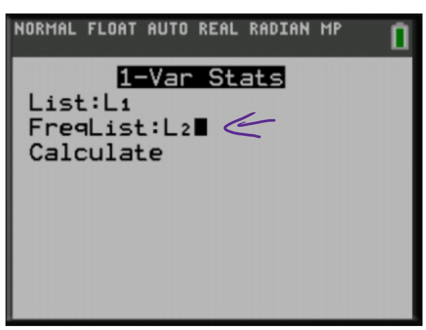
$$= \sqrt{0.5}$$

$$\approx \boxed{0.71}$$

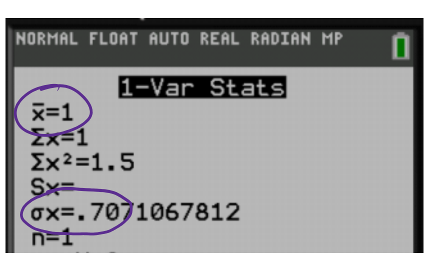
TI-84: Put on the list first:



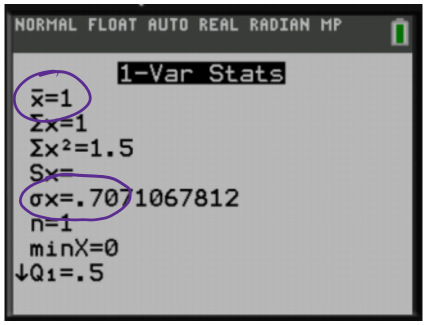
⇒ Stat → CALC → 1: 1-var Stats:



then:



then:

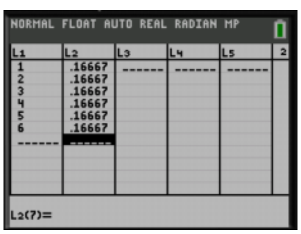


eg. Here is a probability distribution of rolling a die:

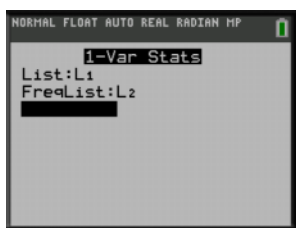
x	1	2	3	4	5	6
$P(x)$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

Find the mean and the standard deviation.

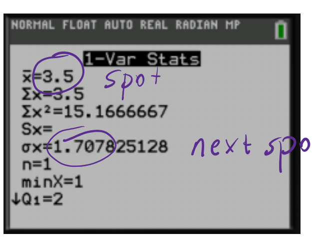
S:



→



⇒



spot

next spot

eg Here is a probability distribution of the sum of two dice.

S: 2 — 12

sum of two dice.

S: 2 − 12

Sum	P(Sum)
2	$\frac{1}{36}$
3	$\frac{2}{36}$
4	$\frac{3}{36}$
5	$\frac{4}{36}$
6	$\frac{5}{36}$
7	$\frac{6}{36}$
8	$\frac{5}{36}$
9	$\frac{4}{36}$
10	$\frac{3}{36}$
11	$\frac{2}{36}$
12	$\frac{1}{36}$

6 × 6 sample space

We have the mean and the standard deviation:

$$\mu = \boxed{7}$$

for sum of two dice

$$\sigma = \boxed{2.4}$$

Here is a **probability distribution** for the number of **baby girls in 8 births:**

📊 Probability Distribution Table:

Girls (k)	Probability $P(X = k)$
0	$\binom{8}{0}(0.5)^8 = 0.0039$
1	$\binom{8}{1}(0.5)^8 = 0.0313$
2	$\binom{8}{2}(0.5)^8 = 0.1094$
3	$\binom{8}{3}(0.5)^8 = 0.2188$
4	$\binom{8}{4}(0.5)^8 = 0.2734$
5	$\binom{8}{5}(0.5)^8 = 0.2188$
6	$\binom{8}{6}(0.5)^8 = 0.1094$
7	$\binom{8}{7}(0.5)^8 = 0.0313$
8	$\binom{8}{8}(0.5)^8 = 0.0039$

> These values are rounded to 4 decimal places.

Here,

$\mu = 4$ girls $\quad \sigma \approx 1.4$ girl