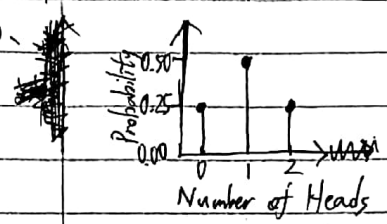
Stats 10
Homework 5

b 4. a. Continuous.
b. Discrete.

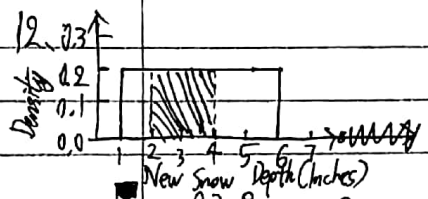
10. All possible arrangements: TT, TH, HT, HH
$P(0H) = \frac{1}{4} = 0.25$
$P(1H) = \frac{2}{4} = \frac{1}{2} = 0.5$ $P(2H) = \frac{1}{4} = 0.25$

Number of Heads	Probability
0	0.25
1	0.5
2	0.25

b.

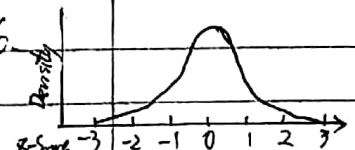


12. 0.3



$P = \frac{0.2 \times 2}{0.2 \times 5} = \frac{2}{5} = 0.4$

16.

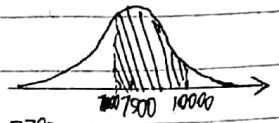


Height 57.5 60 62.5 65 67.5 70 72.5
a. V $(72.5-65) \div 2.5 = 3$ ~~$(1-99.7\%) \div 2 \approx 0$~~
b. ii $(70-65) \div 2.5 = 2$, $(65-60) \div 2.5 = 2$
c. iv $(67.5-65) \div 2.5 = 1$ $68\% \div 2 = 34\%$
d. iii $(67.5-65) \div 2.5 = 1$, $(65-62.5) \div 2.5 = 1$
e. v $(65-57.5) \div 2.5 = 3$ ~~$(1-99.7) \div 2 \approx 0$~~
f. iii $(70-65) \div 2.5 = 2$, $(65-60) \div 2.5 = 2$

24. ~~a. 1.000~~ 五
~~b. 1.000~~
~~c. 1.000~~
d. The probability with $z = -30.00$ would be the largest; the probability with $z = -4.00$ would be the smallest.

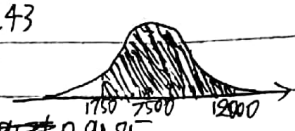
e. The area below (to the left of) $z = 8.00$.

30. a. $z_1 = \frac{7000-7500}{1750} \approx -0.29$
$z_2 = \frac{10000-7000}{1750} \approx 1.71$



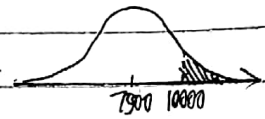
$\therefore p_a = 0.9564 - 0.3859 = 0.5705$

b. $z_1 = \frac{5000-7500}{1750} \approx -1.43$
$z_2 = \frac{12000-7500}{1750} \approx 2.57$



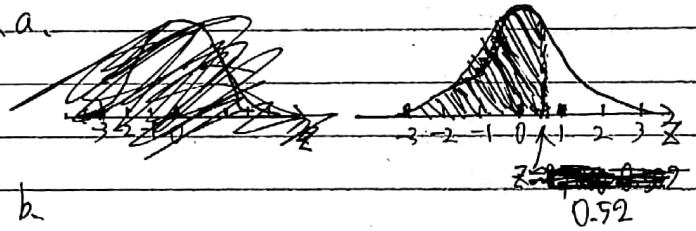
$p_b = 0.9949 - 0.0764 = 0.9185$

c. $z = \frac{10000-7500}{1750} \approx 1.43$
$\therefore p_c = 1 - 0.9236 = 0.0764$

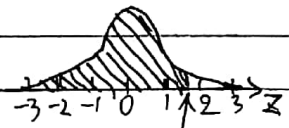


40. a. $z = \frac{68-65}{2.5} = 1.20$ This asks for probability.
$\therefore p_a = 1 - 0.8849 = 0.1151$
b. $1 - 2\% = 0.98$, correspond to $z \approx 2.05$
$\therefore h = 2.5z + 65 \approx 70.125$ This asks for measurement

44. a.



b.



$z \approx 1.64$

58. Each trial is independent because each toss never influences the next toss.
The number of trials is fixed at 4.
There are only two outcomes: success (Head) and failure (Tail) for each trial. Binomial experiment
P(success) is fixed at 50%.
All four requirements are fullfilled. ∴ This is

80. a. $90\% \cdot 100 = 90$

b. $\sigma = \sqrt{np(1-p)}$

$= \sqrt{100 \cdot 90\% (1-90\%)}$

$= 3$

c. $90 - 2\times 3 = 84$, $90 + 2\times 3 = 96$

∴ the number of people passing the test will be as low as 84 and as high as 96.

d. No, because 89 is smaller than the mean ($\mu = 90$).

62. The probability of "success" (divorce) is not fixed among the 20 people since for the 10 people married for their first time, this probability is 0.2 while for the other 10 people, this probability is 0.30.

64. a. $n = 20$ $p = \frac{1}{10} = 0.1$

$x = 6$

b. $n = 20$ $p = 50\%$

$x = 6$