review q 4: 3 * .6 * .6 * .4

5 $\binom{3}{1,1,1} = \frac{3!}{1!\,1!\,1!} = 3$

$3\left(\frac{\cancel{16}\ 18}{38}\right)^1\left(\frac{\cancel{16}\ 18}{38}\right)^1\left(\frac{2}{38}\right)$

6

A = event that you picked 6-sided die
p(A) = 1/2
2 = event that you threw 2
p(2|A) = 1/6
p(2|A') = 1/12
P(2 and A) = p(2|A) p(A) = 1/12
p(2 and A') = p(2|A') p(A') = 1/24
p(2) = 1/8
p(A|2)? p(A|2) p(2) = p(2 and A)
p(A|2) = 2/3

7 you think

8 even: 2 4 6 8 10 12 p=1/2
mult of 3: 3 6 9 12 p=1/3
both: 6 12 p= 1/6
indep? definition A, B indep iff p(A and B) = p(A) p(B)
yes

What if S={1,2,....10}

even: 2 4 6 8 10 p= 1/2
mult of 3: 3 6 9 p=3/10
both: 6 p=1/10

indep? no

.

text prob 2.99 on p 91

p = .05 of a particular chip being bad

if I buy 8 chips p(all good)? .95^8
if I buy 9 chips p(exactly 8 good) = (9 choose 1) .95^8 .05
= .29
p(I had to buy 9 to get 8 good ones) = (8 choose 1) .95^8 .05

p(I had to buy 10 to get 8 good) = (9 choose 2) .95^8 .05^2

p(I had to buy n to get 8 good) = (n-1 choose 7) .95^8 .05^(n-8)

Iclicker 3. 1 p(1 bad) = 1e-10.
if all indep, approx p(any 1 of 9) = 9* 1e-10.

next level of accuracy, use binomial.

9* 1e-10^1 (1-1e-10)^8

to approx (1-e)^n = 1-ne if n big and e small and ne small.

(1-e)^n = 1-ne + (n choose 2) e^2 - (n choose 3) e^3 ....

here e is any small number not 2.718..

.99^10? (1-.01)^10 = 1 - 10*.01 + 45 * .0001 + ...

= 1 -.1 + .0045 - ....

X is a r.v. uniform in [10,20].

f(x) = 0 if x < 10
.1 if 10<x<20
0 if x>20

p(a<x<b) = $\int_a^b f(x)\,dx$

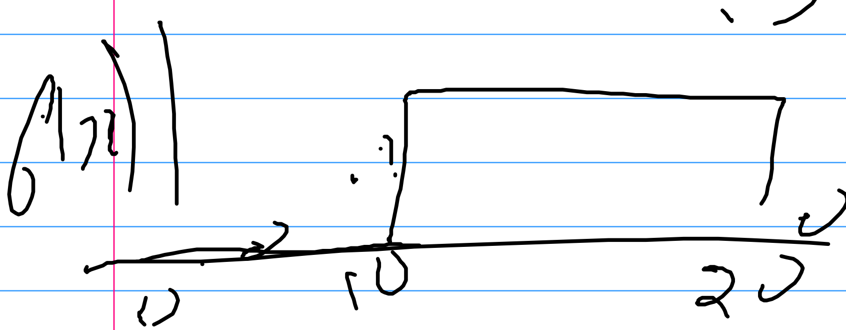
$$P(12 < x < 18) = \int_{12}^{18} f(x)\,dx$$

$$= \int_{12}^{18} .1\,dx$$

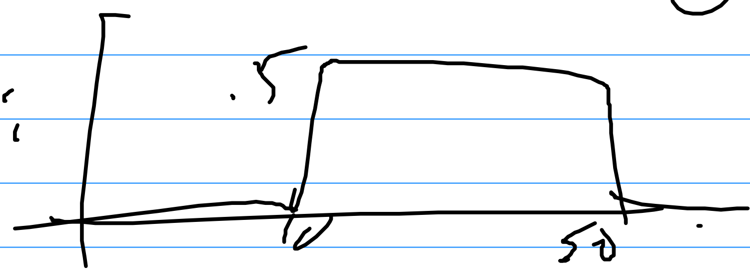
$$= .6$$

$$P(5 \le x \le 15) = \int_{5}^{15} f(x)\,dx$$

$$= .5$$



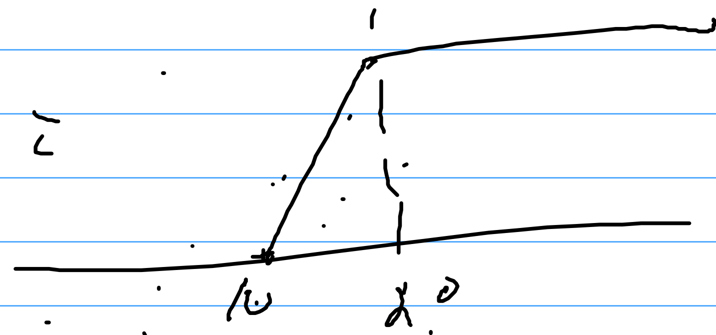
$f(x) =$



$F(x) = P(X \le x)$

$F(x) =$

CDF



$$F(x) = \int_{-\infty}^{x} f(y)\,dy$$

Normal dist

$$f(x) = \frac{1}{\sqrt{2\pi}} e^{\left(-x^2/2\right)}$$

$\mu = 0$

$\sigma = 1$