```
# INCOMPLETE BETA FUNCTION
ibeta<- function(x,a,b){pbeta(x,a,b)*beta(a,b) }



yieldB_jones<- function(b,k,tmax,t0,F,M,Tr,Recruits,Winf)
        {
        r = Tr-t0# tr-t0
        X = exp(-k*r)
        X1= exp(-k* (tmax-t0))
        P = ((F+M)/k)
        Q = b + 1 # assumes allometric scaling
        out<- ((F*Recruits*exp(F*r)*Winf)/k)* ibeta(X,P,Q)-ibeta(X1,P,Q)
        return(out)
        }
# END



F =0.49
M = 0.2
Lambda=8.8
Winf=11.41
Z= 0.69
t0= 0.07
tR = 4.2
r = 4.13 # te-t0????
t_lambda = 13
k = 0.14
bprime = 3.07
X = 0.550
P= 4.93
Q = 4.07
R=1000
yieldB_jones(3,0.14,13,0.07,0.49,0.2,4.2,1000,11.41)


# equation 10.24 ricker
F*R*exp(-M*(r))*Winf*
        (1/(F+M)
        - (3*exp(-k*(r)))/(F+M+k)
        + (3*exp(-2*k*(r)))/(F+M+2*k)
        - (1*exp(-3*k*(r)))/(F+M+3*k))
# should return ~577
```

```
# INCOMPLETE BETA FUNCTION
        ibeta<- function(x,a,b){pbeta(x,a,b)*beta(a,b) } # this has been validated to give the right results
        X = exp(-k*r)
        X1= exp(-k* (t_lambda-t0))
        P = ((F+M)/k)
        Q = 3+1 # assumes allometric scaling
        ((F*R*exp(F*r)*Winf)/k)* ibeta(X,P,Q)-ibeta(X1,P,Q)#can drop second ibeta when tlabda is large
        # should be ~ 577 ricker equatino 10.25 page 257
```