1)

q	lower rectangle rule
a	0.03125
b	-0.25
c	-0.4
d	0
e	0.2432

2)

q	mid point rule	trapezoid rule	simpsons 1/3rd rule
a	0.1582	0.26562	0.19401
b	-0.26667	-0.26786	-0.26706
c	-0.67532	-0.86667	-0.73911
d	1.8039	4.1433	2.5837
e	-0.011895	-0.037024	-0.020272

3)

lower rectangle rule	trapezoid rule	simpsons 1/3rd rule	simpsons 3/8th rule
4	3	3.13333333333333	3.13846153846154

4)ans=7.125

5)

$f(x)=x\ln(x)$
$f'(x)=1+\ln(x)$
$f''(x)=1/x$
$f'''(x)=-1/x^2$
$f''''(x)=2/x^4$

$\max_{1<=x<=2} f''(x)=1$
$\max_{1<=x<=2} f''''(x)=2$

Here $m=10^{-5}$
(actual-calculated)/actual<=±m
(actual-calculated)/calculated<=(1/(1±m)-1)
actual-calculated=error

a) Composite Trapezoidal rule:
$error=(-h^2(b-a)/12)f''(c_n)<=(-h^2/12)$
n=115
h=0.0086
area=0.636298728771027

b)Composite Simpson's rule:

error=$(-h^4(b-a)/180)f''(c_n)<=(-h^4/90)$
n=7
h=0.1428
area=0.636294469092996

c)Composite Midpoint rule:
error=$(-h^2(b-a)/24)f''(c_n)<=(-h^2/24)$
n=81
h=0.0123
area=0.636289959200426

6)length of the track in feet is(using composite trapezoid rule):9855