**1a.**

**Rise and Fall :**

* **It is easy to spot errors**
* **It is tedious**
* **It is preffered if there are many intermediate stations**
* **It has more calculations.**

**Height Of Collimation:**

* **It is faster than rise and fall**
* **It is fairly**
* **It is preffered if there are less or no intermediate stations**
* **It is quicker and less of calculation needed.**

****

QUESTION **2a**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Chainage(m) | 0 | 30 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 |
| Offset length(m) | 0 | 2.65 | 3.80 | 3.75 | 4.65 | 3.60 | 5.00 | 5.80 | 6.10 | 5.85 |

Using Mid-ordinate rule:

A=hd

h1= =1.325m

h2= =3.225m

h3= =3.775m

h4= =4.2m

h5= =4.125m

h6= =4.3m

h7= =5.4m

h8= =5.9m

h9= =5.925m

38.175m

d=30m

A=

=

A=

Using average ordinate rule

A=

n=9

d=30

41.2m

A=

A=

Using trapezoidal rule

A=

A=

A=

A=

Using Simpson's rule

Note: Last offset was removed because number of offsets were even

Calculating for last offset using trapezoidal rule

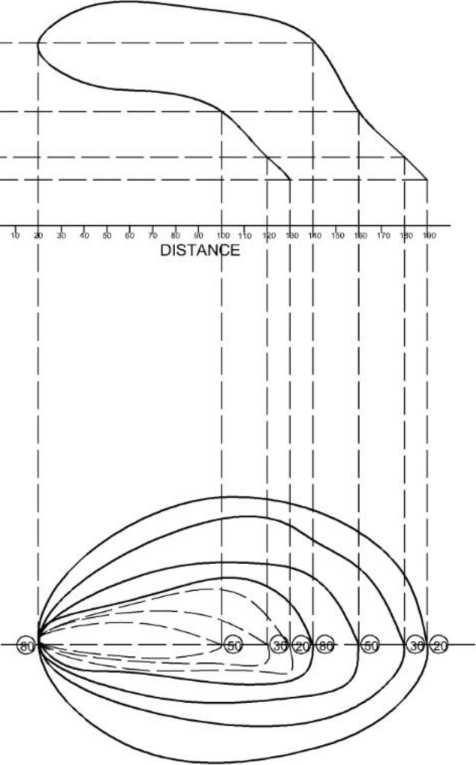
A=

Therefore

**2b**

NolivALlJlLlJ

contour lines cannot merge or cross one another except in the case of an hanging beam

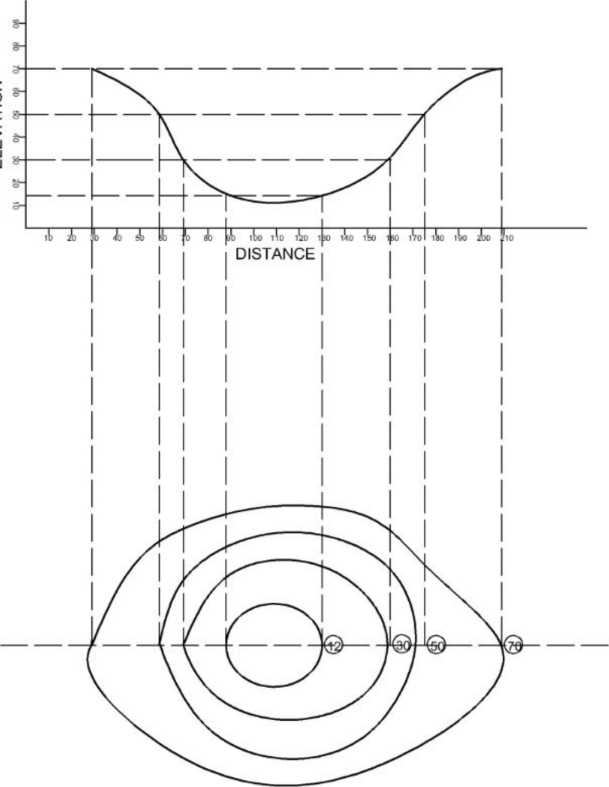














NOI1<>11J\_J山