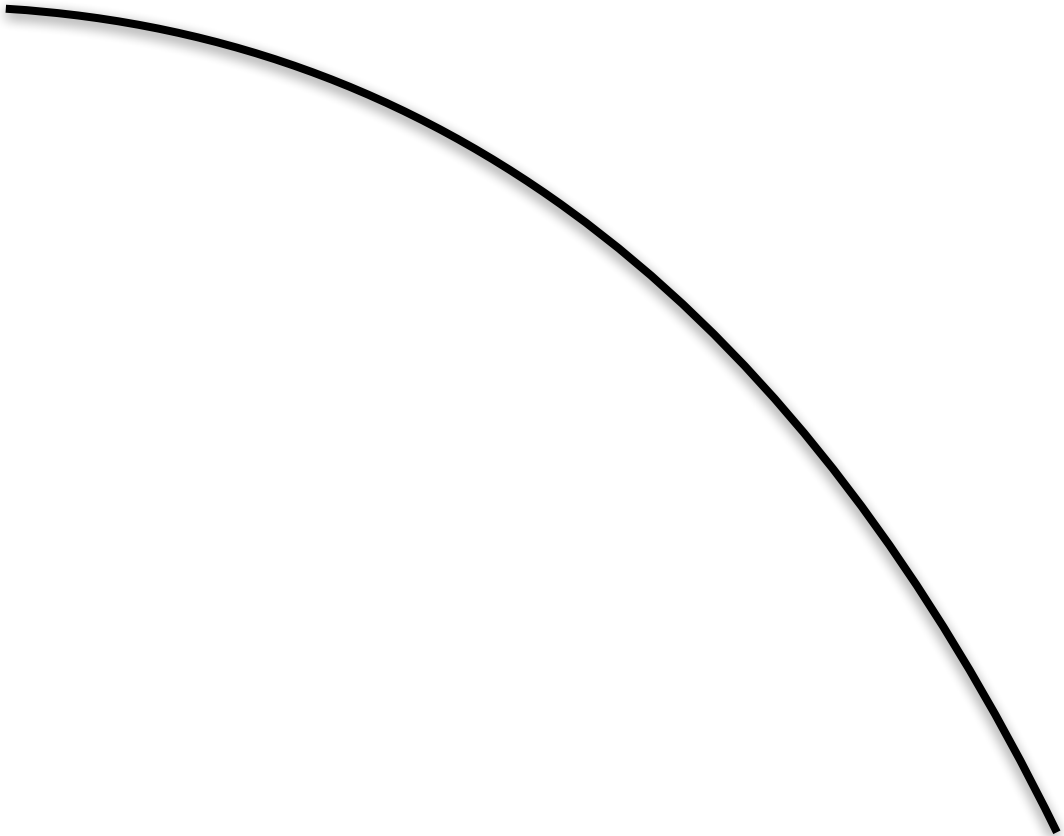




110-----





115



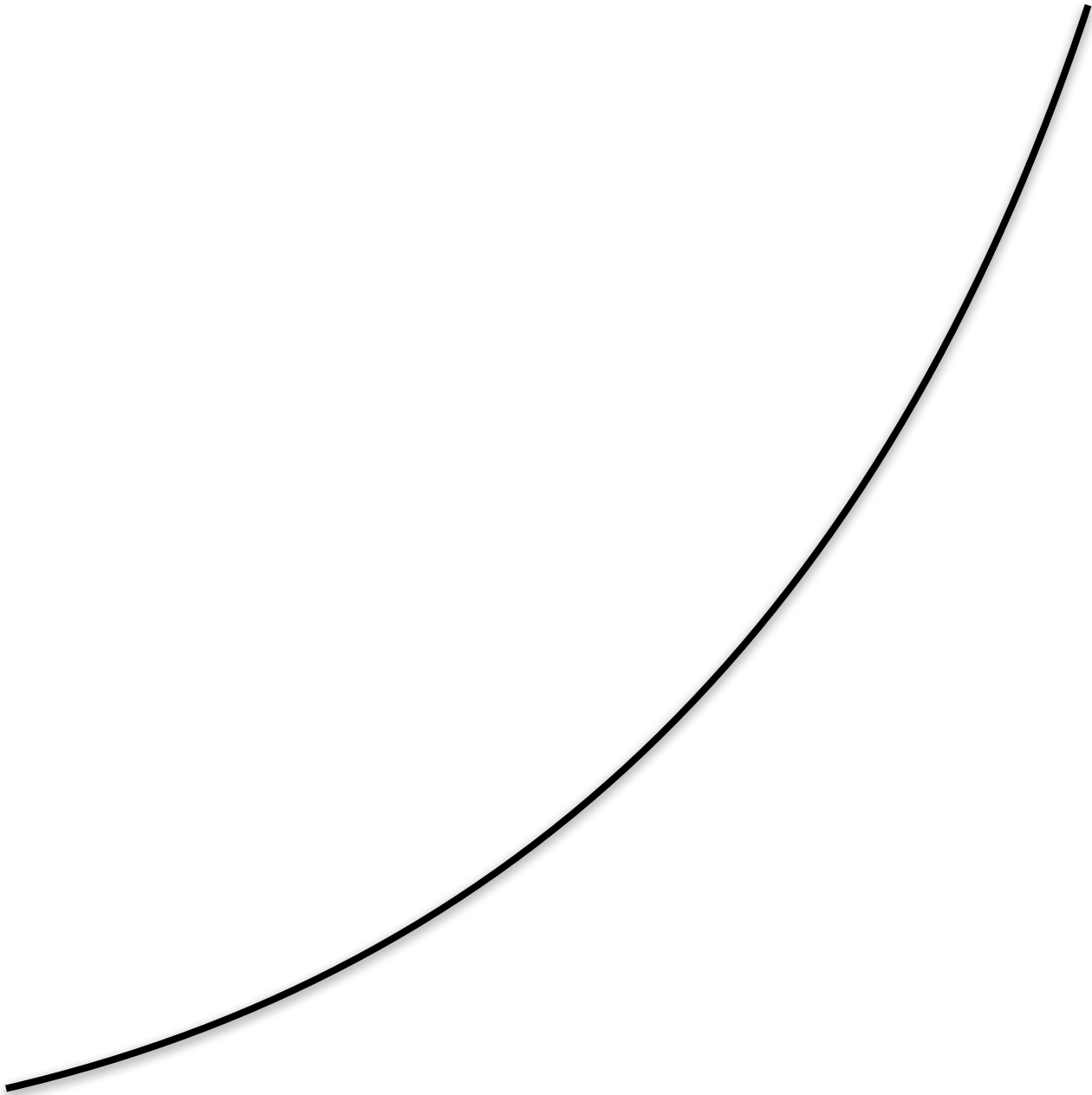


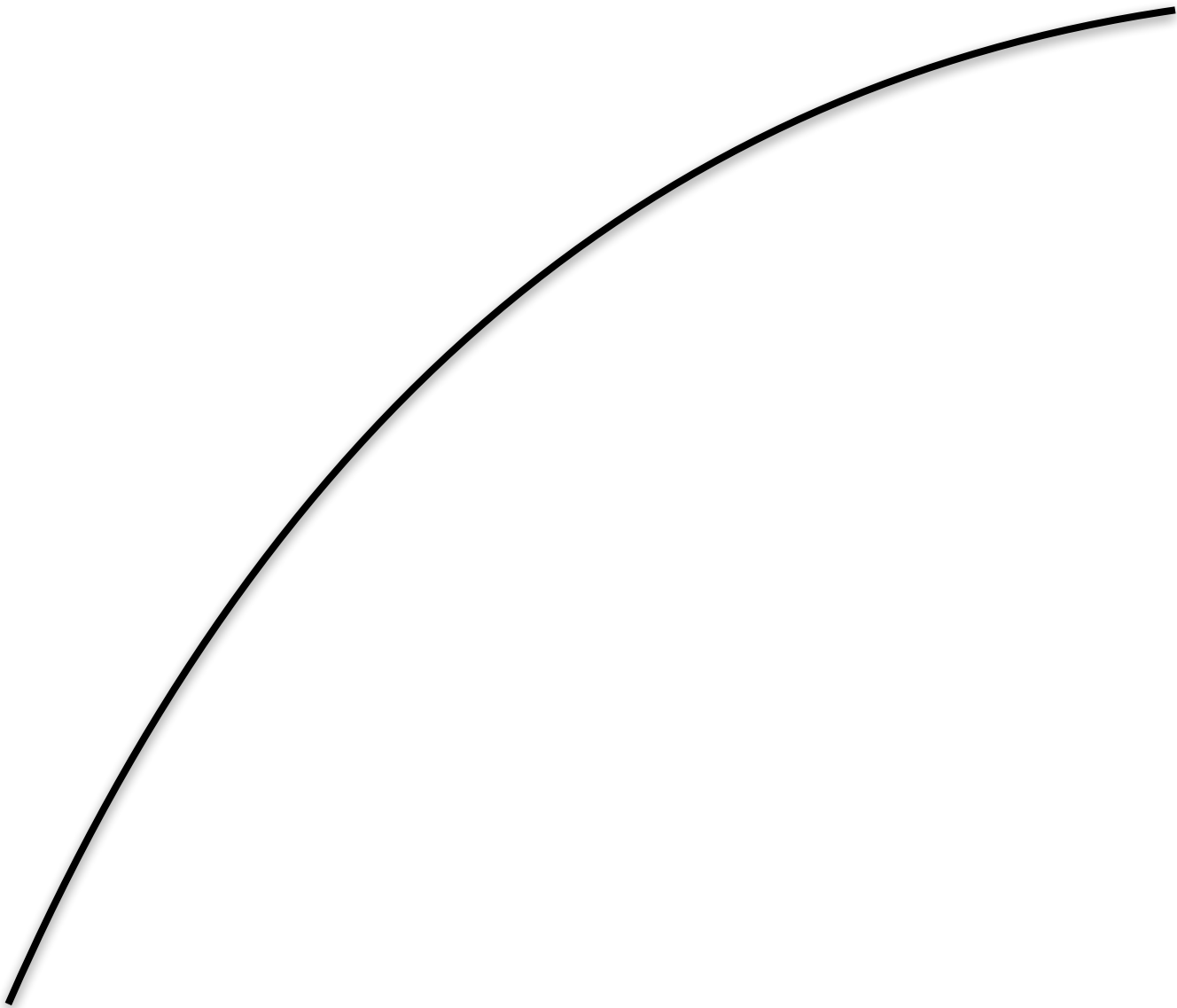


















2

3



4

5









10





12

1

3

1

4

15

16



5

-

-

-

-

-

-

-

12. — — — — — — — — — —



21 - - - - -

33

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

—

47

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

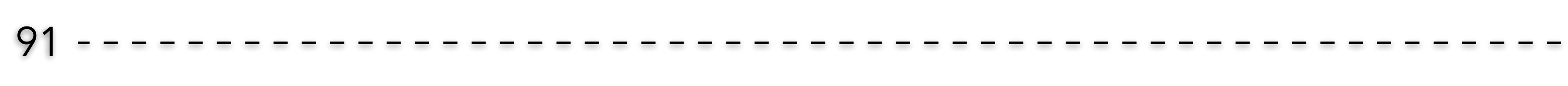
-

-

-

63 . - - - - -

102 -----



78 . - - - - -

117.....

















1. The first part of the document is a title page.

2. The second part of the document is a table of contents.

3. The third part of the document is a list of figures.

4. The fourth part of the document is a list of tables.

5. The fifth part of the document is a list of references.

6. The sixth part of the document is a list of appendices.

7. The seventh part of the document is a list of footnotes.

8. The eighth part of the document is a list of glossary terms.

9. The ninth part of the document is a list of abbreviations.

10. The tenth part of the document is a list of symbols.

11. The eleventh part of the document is a list of units.

12. The twelfth part of the document is a list of equations.

13. The thirteenth part of the document is a list of diagrams.

14. The fourteenth part of the document is a list of figures.

15. The fifteenth part of the document is a list of tables.

16. The sixteenth part of the document is a list of references.

17. The seventeenth part of the document is a list of appendices.

18. The eighteenth part of the document is a list of footnotes.

19. The nineteenth part of the document is a list of glossary terms.

20. The twentieth part of the document is a list of abbreviations.











1

7



Using the Total Product (TP) to calculate the Marginal Product (MP)

T

P







L	TP
0	0
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	



































5

12

21

33

47

63



78

91

102

110

1

1

5

1

1

7

1

1

5

1

1

0



102

91

1

5





9



12



14



16





15



1

3





8

15

2.

$$\text{MP}_1 = -2$$



$$MP_{15} = -8$$





$MP_{17} = -13$

MP

-

5

-

0

=

5

$$12 - 5 = 7$$

$$21 - 12 = 9$$

$$33 - 21 = 12$$

$$47 - 33 = 14$$

$$63 - 47 = 16$$



$$78 - 63 = 15$$

$$91 - 78 = 13$$

$$102 - 91 = 11$$

$$110 - 102 = 8$$

$$115 - 110 = 5$$

$$117 - 115 = 2$$

78

$$115 - 117 = 2$$



$$110 - 115 = -5$$

$$112 - 110 = 2$$

91-102 = 111

78-91==13

$$I_{MP_{14}} = -5$$



$$MP_{16} = -11$$

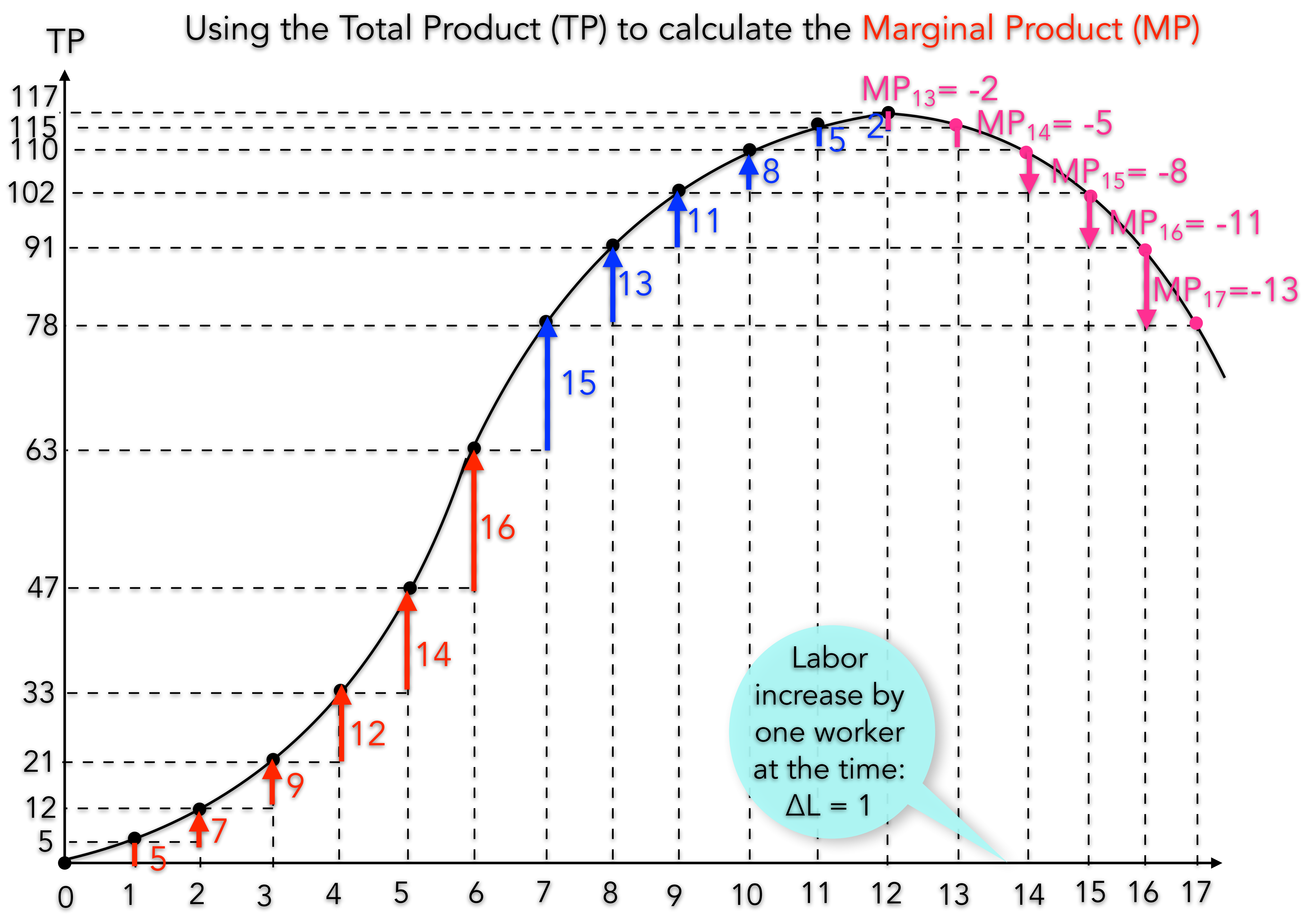






Labor  
increase by  
one worker  
at the time:

$$\Delta L = 1$$



L	TP	MP
0	0	-
1	5	$5 - 0 = 5$
2	12	$12 - 5 = 7$
3	21	$21 - 12 = 9$
4	33	$33 - 21 = 12$
5	47	$47 - 33 = 14$
6	63	$63 - 47 = 16$
7	78	$78 - 63 = 15$
8	91	$91 - 78 = 13$
9	102	$102 - 91 = 11$
10	110	$110 - 102 = 8$
11	115	$115 - 110 = 5$
12	117	$117 - 115 = 2$
13	115	$115 - 117 = -2$
14	110	$110 - 115 = -5$
15	102	$102 - 110 = -8$
16	91	$91 - 102 = -11$
17	78	$78 - 91 = -13$

Using the Total Product (TP) to calculate the Marginal Product (MP)

Labor (L)	TP	MP
0	0	
1	5	5-0=5
2	12	12-5=7
3	21	21-12=9
4	33	33-21=12
5	47	47-33=14
6	63	63-47=16
7	78	78-63=15
8	91	91-78=13
9	102	102-91=11
10	110	110-102=8
11	115	115-110=5
12	117	117-115=2
13	115	115-117=-2
14	110	110-115=-5
15	102	102-110=-8
16	91	91-102=-11
17	78	78-91=-13