For comments, corrections, etc...Please contact Ahnaf Abbas: <u>ahnaf@uaemath.com</u>

International Institute for Technology and Management



## Unit 05a : Mathematics 1

## Handout #13

IntegrationV: Study Guide pp: 71 – 78

Торіс	Interpretation
Cost Function :	VC :Variable cost
TC = VC + FC	FC : Fixed cost
FC = TC(0)	FC : Design product, setup factory
Example: The total Cost	vc . Labor, machais, packing shipping
function of Manufacturing an	$FC = TC(0) = 32(0)+9(0^{2})-4(0^{3}) + 43$
item is : TC $-22z + 0z^2 + 4z^3 + 42$	= 43
$1C = 32q + 9q - 4q^2 + 43$ Find the fixed cost	
Average Cost	
TC	TC
$AC = \frac{TC}{T}$	$AC = \frac{10}{2} \Rightarrow TC = q \times AC$
q	q
<b>Example:</b> the average cost	$TC = q (q + \frac{1}{1} + \ln(1+q^2))$
function of an item is :	$1C = q (q + \frac{q^2}{q^2} + \frac{q}{q})$
$AC = q + \frac{1}{1} + \frac{\ln(1+q^2)}{1}$	$TC = a^2 + 1 + ln(1+a^2)$
$q^2$ $q$	
Find the Total cost.	
Average Variable Cost AVC	VC  TC - FC
TC = VC + FC	AVC =
$\Rightarrow$ VC = TC – FC	q q q
VC  VC  TC - FC	$AVC = \frac{5q - 2q^2 + 3q^2 + 20 - 20}{4}$
AVC =	q
Y Y Example: A company's total	$5a - 2a^2 + 3a^3$
cost function is :	$AVC = \frac{3q}{2q} \frac{2q}{13q}$
$TC = 5a - 2a^2 + 3a^3 + 20$	q
Its fixed cost is 20. Find the	$AVC = 5 - q + 3q^2$
average variable cost.	

Marginal Cost	TC = 3.5q + 800
Cost of Making one more item	a.)FC = $TC(0) = 0 + 800 = 800$
after q has been made.	
$MC = TC' = \frac{d}{da}TC$	b.)TC(12) = $3.5(12) + 800 = 842$
<b>Example 1</b> : the total cost	c.)MC = TC' = $3.5$
function for producing a	
kilograms of Chocolate is :	d.)MC $(40) = 3.5$
TC = 3.5 q + 800 Find :	Example 2:
a.)The fixed cost ,b.)the total	$\ln(1+a^2)$
cost for 12 kilograms ,c.)the	$AVC = q^2 + 2q + \frac{m(1+q)}{2}$ ; FC = 9
d )the marginal cost of the 40 <sup>th</sup>	q
Kilogram	$d_{TC}$
<b>Example2:</b> A firm has	$MC = \frac{1}{da}IC$
average variable cost	TC - VC + FC
$\ln(1+a^2)$	TC = VC + FC
$q^2 + 2q + \frac{m(1+q^2)}{2}$	$TC = \alpha(A)(C) + FC$
q	TC = q(AVC) + FC
and a fixed cost of 9. Find the	$T_{2}$ $x^{3} + 2x^{2} + 4x(1 + x^{2}) + 0$
total cost function and the	$IC = q^{2} + 2q^{2} + In(1+q^{2}) + 9$
marginal cost.	
(LSE EXAIII 2004)	$MC = \frac{d}{dTC} = 3a^2 + 4a + \frac{2q}{dTC}$
	$dq = \frac{1}{dq} + \frac{1}{1+q^2}$
$TC \rightarrow MC \rightarrow TC$	$MC = 1 + e^{0.5q} + q^2$ ; $FC = 10$
$MC = TC' \implies TC = \int MC$	TC =?
<b>Example</b> A firm has marginal	$TC = \int MC = \int (1 + e^{0.5q} + a^2) da$
cost function	$\mathbf{f} \mathbf{C} = \int \mathbf{M} \mathbf{C} = \int (\mathbf{I} + \mathbf{C} + \mathbf{q}) d\mathbf{q}$
	$TC = q + \frac{1}{a^{0.5q}} + \frac{q^3}{c^3} + C$
$1 + e^{0.5q} + q^2$	$10 = q + \frac{1000}{0.5}e^{-1} + \frac{1000}{3}e^{-1}$
and fixed costs of 10.Find the	FC = TC(0) = 10
total cost function.	
(LSE Exam 2004)	$0 + 2e^{0} + 0/3 + C = 10$
· · · · ·	0 1 20 1 0/3 1 0 = 10
	$2 + C = 10 \rightarrow C = 8$
	$2 + C = 10 \Rightarrow C = 8$
	$2 + C = 10 \Rightarrow C = 8$
	$2 + C = 10 \implies C = 8$ $TC = q + 2e^{0.5q} + \frac{q^3}{4} + 8$