Profit Maximization by the Firm

SITUATION 1: PRICE TAKER - firm has no control over price, and takes price as "given" – objective of firm is to sell the amount of output that will maximize its profits

Way 1: Calculate profit at alternative production level; "given" price is $15 per pizza

# pizzas sold	revenues	total cost	profit	
0	$0	$10,000	-$10,000	
1000	$15,000	$18,000	-$3000	
2000	$30,000	$24,000	$6000	
3000	$45,000	$27,000	$18,000	
4000	$60,000	$40,000	**$20,000**	**Maximize profit here**

Another example: "Given" price is $12 per pizza

# pizzas sold	revenues	total cost	profit	
0	$0	$10,000	-$10,000	
1000	$12,000	$18,000	-$6000	
2000	$24,000	$24,000	$0	
3000	$36,000	$27,000	**$9000**	**Maximize profit here**
4000	$48,000	$40,000	$8000	

Way 2: Go to the output level as long as Price is greater than Marginal Cost

# pizzas sold	total cost	marginal cost
0	$10,000	-
1000	$18,000	($18,000-$10,000)/1000 = $8
2000	$24,000	($24,000-$18,000)/1000 = $6
3000	$27,000	($27,000-$24,000)/1000 = $3
4000	$40,000	($40,000-$27,000)/1000 = $13

At $15 per pizza, all marginal costs are covered, so produce at 4000 pizzas

But at $12 per pizza, stop at 3000 pizzas, because for 4000, P<MC

SITUATION 2: PRICE SETTER – firm has enough unique characteristics that it can set its own price – choose price and output level that will maximize profit – notice the firm faces a "demand curve" – higher the price, the less output sold

Way 1: Calculate profit at alternative price and output levels

Price	# pizzas	revenues	total cost	profit	
-	0	$0	$10,000	-$10,000	
$20	1000	$20,000	$18,000	$2000	
$15	2000	$30,000	$24,000	$6000	
$12	3000	$36,000	$27,000	**$9000**	**Maximize profit here**
$10	4000	$40,000	$40,000	$0	

Way 2: Go to output level as long as Marginal Revenue is greater than Marginal Cost

Note: In the "price-taker" case, price is marginal revenue, meaning the additional revenue derived from selling one more unit of output is price. But in the "price-setter" case, to sell more, must change price for all units sold. So marginal revenue is the change in revenue divided by the change in output.

Price	# pizzas	revenues	marginal revenue	marginal cost	
-	0	0	-	-	
$20	1000	$20,000	($20,000-$0)/1000 = $20	$8	
$15	2000	$30,000	($30,000-$20,000)/1000 = $10	$6	
$12	3000	$36,000	($36,000-$30,000)/1000 = $6	$3	**Maximize profit here**
$10	4000	$40,000	($40,000-$36,000)/1000 = $4	$13	