

Problem Statement: Increasing the monthly production of backpacks for certain months, calculating and analyzing impact of it on ROI

ROI (Return on Investment): Ratio of net profit and cost of investment. It is used to evaluate the efficiency of an investment.

Calculations:

Cost to produce one backpack = \$ 15.00

Selling price per backpack = \$ 20.00

Original production per month: 10000 backpacks

Original orders per month:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
8000	8000	8000	8000	10000	10000	8000	12000	12000	10000	10000	10000

New orders:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
8000	8000	8000	8000	10000	10000	14000	14000	14000	10000	10000	10000

Difference

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	0	0	0	2000	2000	4000	0	0

- \$2.00 overhead for production between 10000 - 12000
- \$3.00 overhead for production between 12000-14000
- \$15.00 cost for producing one backpack

Production cost per month with old orders:

Jan	$8000 * 15 = 120,000$
Feb	$8000 * 15 = 120,000$
Mar	$8000 * 15 = 120,000$
Apr	$8000 * 15 = 120,000$
May	$10000 * 15 = 150,000$
Jun	$10000 * 15 = 150,000$
Jul	$8000 * 15 = 120,000$
Aug	$(10000 * 15) + (2000 * 17) = 150000 + 34000 = 184,000$
Sep	$(10000 * 15) + (2000 * 17) = 150000 + 34000 = 184,000$
Oct	$10000 * 15 = 150,000$
Nov	$10000 * 15 = 150,000$

Dec	$10000 * 15 = \mathbf{150,000}$
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Production cost per month with New Orders:

Jan	$8000 * 15 = \mathbf{120,000}$
Feb	$8000 * 15 = \mathbf{120,000}$
Mar	$8000 * 15 = \mathbf{120,000}$
Apr	$8000 * 15 = \mathbf{120,000}$
May	$10000 * 15 = \mathbf{150,000}$
Jun	$10000 * 15 = \mathbf{150,000}$
Jul	$8000 * 15 = \mathbf{120,000} + 2000 * 15 + 2000 * 17 + 2000 * 18 = \mathbf{220,000}$
Aug	$(10000 * 15) + (2000 * 17) + (2000 * 18) = 150000 + 34000 + 36000 = \mathbf{220,000}$
Sep	$(10000 * 15) + (2000 * 17) + (2000 * 18) = 150000 + 34000 + 36000 = \mathbf{220,000}$
Oct	$(10000 * 15) = \mathbf{150,000}$
Nov	$10000 * 15 = \mathbf{150,000}$
Dec	$10000 * 15 = \mathbf{150,000}$
Total	18,90,000

Reference: <https://www.business.org/finance/cost-management/how-to-measure-your-return-on-investments-roi/>