# Pricing & receipt percentages

Practice margin versus markup, prepare one order cost, and explain a tax-inclusive rounding difference. All amounts are synthetic USD examples. Targets are teaching inputs, not recommended prices.

Name or group _____

Item, order or period _____

Costs included / costs omitted _____

## A. Same cost, different denominators

An order has **$80.00** of included costs. Compare a **20% margin** target with a **20% markup** target. Margin divides profit by selling price; markup divides profit by included cost.

Margin price = cost / (1 - margin / 100)
Markup price = cost x (1 + markup / 100)
Profit = price - cost; achieved margin = profit / price x 100

| Find | Your answer |
|---|---|
| Price for 20% margin / profit | $_____ / $_____ |
| Price for 20% markup / profit | $_____ / $_____ |
| Achieved margin at the markup price | _____ % |

Why do the two prices differ? _____

Check with Profit Margin Calculator (Target revenue) and Markup Calculator (Set selling price).

## B. Build the cost before applying a percentage

A cake order includes ingredients $40, decorations $5, packaging $5, labor $20, allocated overhead $10 and delivery $0. It has **20 entered servings**. Labor is already included.

1. Add the six costs. Included cost: $_____
2. At 20% margin, order price: $_____; per serving: $_____
3. A separate flour row uses 375 g from a 3000 g package costing $12.00. Allocated cost: $_____

Why not add package rows and the same combined ingredient cost? _____

Cake Pricing Calculator accepts either combined ingredients or package rows and saves an internal costing PDF/CSV. The flour row is a separate exercise; do not add it to the $40 ingredient case.

# Check the cents, then explain

## C. A price that actually meets the target

Included cost is **$80.01** and the chosen margin is **20%**. The exact price threshold is **$100.0125**. Which whole-cent price meets or exceeds the target: $100.01 or $100.02?

Your choice _____

Show the reason _____

Use Target revenue in Profit Margin Calculator, or a target margin in Cake Pricing Calculator. A display rounded to 20.00% does not prove the exact target was reached.

## D. Allocate included tax and check forward rounding

A known-rate, tax-inclusive amount is **$10.04 at 8.25%**. Divide the total by 1.0825 and round the base to cents. Allocate included tax as entered total minus that rounded base.

| Step | Your answer |
|---|---|
| Cent-rounded base: 10.04 / 1.0825 | $_____ |
| Allocated included tax: 10.04 - base | $_____ |
| Independently rounded tax: base x 0.0825 | $_____ |
| Forward total: base + rounded forward tax | $_____ |

Does a forward difference prove the original receipt was wrong? _____

Explain what the two rounding paths compare _____

What receipt details are still unknown? _____

Check with Reverse Sales Tax Calculator: enter 10.04 and 8.25 without currency or percent symbols. Use a known rate from the transaction; this worksheet does not determine the rate or what is taxable.

## Keep the scope consistent

Use cost and revenue for the same item, order or period. Count each expense once. Keep omitted costs visible. The calculators do not choose a price, assess customer willingness to pay, automatically add overhead or fees, or estimate take-home income. Serving counts are entered, not inferred from cake dimensions. No currency conversion occurs.

Print pages 1-2 for learners; page 3 is the checked answer key. Public tool links are clickable in this PDF. No account or email gate is required.

# Answers & calculation notes

## A. Different denominators

**20% margin:** 80 / 0.80 = **$100.00**; profit is **$20.00**. Profit is 20% of price and 25% of cost.
**20% markup:** 80 x 1.20 = **$96.00**; profit is **$16.00**. Achieved margin = 16 / 96 x 100 = **16.6667%**, displayed as 16.67%. Equal target numbers have different denominators.

## B. Prepare the cost once

40 + 5 + 5 + 20 + 10 + 0 = **$80.00**. At 20% margin, price is **$100.00**, or **$5.00 per entered serving**. Profit above included costs is $20; labor is already included, so this is not total take-home income. The separate flour allocation is 12 x 375 / 3000 = **$1.50**. Adding both that same package cost and a combined ingredient total would count it twice.

## C. Round upward to reach the target

**$100.02** is the first whole-cent price meeting the exact threshold. At $100.01, profit is $20.00 and 20.00 / 100.01 is below 20%; at $100.02, 20.01 / 100.02 is above 20%. Profit Margin target revenue and Cake target price round upward when needed. Standalone Markup rounds set price to the nearest cent, then calculates achieved percentages.

## D. Reconciliation and a forward check

| Independently checked step | Amount |
|---|---|
| Rounded base / allocated tax | $9.27 / $0.77 |
| Forward tax: 9.27 x 0.0825 = 0.764775 | $0.76 |
| Forward total: 9.27 + 0.76 | $10.03 |

The allocated parts sum to the entered $10.04; the forward path is one cent lower. This compares rounding paths. It cannot reconstruct original line items, mixed tax treatments or seller rounding rules, and does not by itself prove an error.

## Sources and tools

VCU open pricing chapter - cost-based pricing background.
California Olive Oil Council pricing education (2014) - margin versus markup.
Washington DOR: tax included in price - jurisdiction-specific context; its rules are not generalized here.

Use: Markup Calculator | Profit Margin Calculator | Cake Pricing Calculator | Reverse Sales Tax Calculator.
Examples and cent rules independently checked against the published BiznTools methods. Engineering validation; no specialist endorsement is claimed.