The Retail Math Workout

Printable Toolkit — Seven Cheat Sheets and Seven Planning Sheets

Sizu Riatto

Math Didn’t Have to Be This Hard: The Workout Series · Book 11

How to Use This Toolkit

This is the printable companion to *The Retail Math Workout*. It has two parts:

- **Seven cheat sheets**, one for each chapter. Every rule is the one the chapter teaches, with one worked example from Nia's shop, Fern Street Goods, in the book.
- **Seven planning sheets** to fill in with your own numbers: a drawer count, a register and discount card, a markup and margin sheet, a markdown worksheet, a shift report, a reorder sheet and a time sheet with a paycheck check.

Print as many copies as you like. Count cash in the back office, not on the counter.

The numbers in the examples are invented for practice, just as they are in the book, and no retailer, brand, register or payment company is named. Tax rates, rounding policies, margins, targets, safety stock and pay plans are *in this example*. Overtime and breaks appear only as the federal facts the book cites; your state may set more, and your employer's handbook sets the details. This toolkit is for learning; it is not legal, tax, HR or financial advice.

The whole set for this book, including seven free calculators:

`mathworkbook.netlify.app/go/book-retail`

1. The Till

Counting cash and making change.

- **Change** = amount handed over − total. **Count up** from the total: coins to the next nickel, quarter or dollar, then bills, saying the running total out loud.
- **Fewest pieces:** largest bill or coin that fits, then the next.
- **Cash rounding** (only where a store uses it, in this example): a total ending in 1 or 2 cents rounds down to 0, 3 or 4 up to 5, 6 or 7 down to 5, 8 or 9 up to 10. Card totals stay exact.
- **Expected drawer** = float + cash taken in − cash refunds − paid-outs.
- **Over/short** = counted − expected (a minus means short). **Deposit** = counted − float; the float stays.
- Count bills face up, all one way, twice.

> **Worked example (Chapter 1).** Nia's first sale: $24.50 + $1.96 tax = $26.46, paid in cash, rounds to **$26.45**. The customer hands her $40: a nickel makes $26.50, two quarters $27.00, three $1 bills $30.00, a $10 bill **$40.00**. Change **$13.55**, 7 pieces. At close: $150.00 + $790.75 net cash = **$940.75** expected; counted $939.75, so **$1.00 short**; deposit $939.75 − $150.00 = **$789.75**.

Your turn. Total _____ Handed over _____ Change _____
Expected drawer _____ Counted _____ Over/short _____

2. At the Register

Sales tax, discounts and coupons.

- **Percent** means per hundred: 8% = 0.08.
- **Sales tax** = taxable subtotal × rate, rounded to the cent once per receipt (in this example). **Total** = subtotal + tax.
- **Discounts and store coupons come off before tax** (in this example). **Sale price** = price × (1 − p).
- **$X off vs p% off:** the percent wins on baskets over X ÷ p.
- **Two discounts in a row multiply:** 20% then 10% = 1 − 0.80 × 0.90 = **28% off**, not 30%.
- **Pre-tax price** = total ÷ (1 + rate). **A refund** gives back the price on the original receipt plus its tax.

> **Worked example (Chapter 2).** A $34.00 basket at 8% tax. **$5 off a $30+ purchase:** $29.00 + $2.32 = **$31.32**. **15% off:** $28.90 + $2.31 = **$31.21**. The 15% wins by **$0.11**, because $34.00 is over $5 ÷ 0.15 = $33.33.

Your turn. Subtotal _____ Discount _____ Tax _____ Total _____

3. Pricing

Cost, markup and margin.

- **Gross profit** = price − cost.
- **Markup on cost** = gross profit ÷ cost × 100. **Margin on price** = gross profit ÷ price × 100. Same dollars, two percents.
- **Price for a target margin m** = cost ÷ (1 − m). **Price for a markup k** = cost × (1 + k).
- **Margin from markup** = k ÷ (1 + k). **Markup from margin** = m ÷ (1 − m).
- **Keystone** (in this example) = 2 × cost = 100% markup = 50% margin.
- **Landed cost** = unit cost + freight ÷ units. **Unit price** = price ÷ units (per ounce, per count).

Markup on cost	25%	50%	100%	150%	200%
Margin on price	20.0%	33.3%	50.0%	60.0%	66.7%

> **Worked example (Chapter 3).** A candle costs $7.20 and sells for $18.00: gross profit $10.80, markup $10.80 ÷ $7.20 = **150%**, margin $10.80 ÷ $18.00 = **60.0%**. A planter costs $9.60; for a 55% margin, $9.60 ÷ 0.45 = $21.33, rounded up to **$21.99**: margin **56.3%**.

Your turn. Cost _____ Price _____ Markup _____ Margin _____

4. Markdowns & Promotions

Sales, clearance and “buy one, get one”.

- **Markdown $** = original − sale. **Markdown %** = markdown $ ÷ original × 100.
- **A second markdown** is taken off the sale price, so the percents multiply: total % off = $1 - (1 - p_1)(1 - p_2)$.
- **Margin after a markdown** = (sale − cost) ÷ sale. Below cost, every sale loses money.
- **BOGO free** = 50% off each of two. **BOGO 50%** = 25% off each. **“3 for $X”** = X ÷ 3 each.
- **Promo break-even units** = regular gross profit × regular units ÷ promo gross profit a unit, rounded up.
- A “was” price should be one the item was really offered at, for a reasonable time.

> **Worked example (Chapter 4).** A candle tin: cost $6.00, was $16.00. **30% off:** $16.00 × 0.70 = $11.20. **Extra 25% off:** $11.20 × 0.75 = **$8.40**. That’s $7.60 off, **47.5%**, not 55%. Margin at $8.40: $2.40 ÷ $8.40 = **28.6%**, still above cost.

Your turn. Original _____ Markdowns _____ Final _____ Total % off _____

5. Selling by the Numbers

Sales per hour, basket size and the target.

- **Sales per hour** = net sales ÷ hours open. **Average sale** = net sales ÷ transactions.
- **Units per transaction** = units ÷ transactions. **Conversion** = transactions ÷ visitors × 100.
- **Percent to target** = actual ÷ target × 100. **Change vs last year** = (this − last) ÷ last × 100.
- **Needed per hour** = (target − so far) ÷ hours left.
- **Sales per labor hour** = net sales ÷ staff hours. **Labor %** = labor cost ÷ net sales × 100.
- **Sales = visitors × conversion × average sale.**

> **Worked example (Chapter 5).** Nia's Saturday: $5,112 on a $4,800 target = **106.5%**; last year $4,650, so **+9.9%**. 142 sales → average sale **$36.00**; 355 units → **2.5** per sale; 568 visitors → conversion **25.0%**. At 2:00 p.m. she had $2,208: ($4,800 − $2,208) ÷ 4 hours = **$648 an hour** needed.

Your turn. Net sales _____ Transactions _____
Average sale _____ % to target _____

6. Stock & Shelves

Counts, reorder points and shrink.

- **Units** = cases × units per case + loose eaches.
- **Reorder point** = average daily sales × lead time (days) + safety stock (in this example).
- At or below the reorder point, **order** = order-up-to – on hand – on order, **rounded up to whole cases**.
- **Weeks of supply** = on hand ÷ weekly sales. **Sell-through** = units sold ÷ units received × 100.
- **Shrink $** = book – counted. **Shrink %** = shrink ÷ net sales × 100: always say what it's a percent of.
- **Turnover** = cost of goods sold ÷ average inventory at cost.

> **Worked example (Chapter 6).** A candle sells 6 a day, the supplier takes 7 days, safety stock 12: reorder point 6 × 7 + 12 = **54**. 58 on hand, 9 sold → **49**, at or below 54, so order: 96 – 49 = 47 → 47 ÷ 12 = 3.9 → **4 cases (48)**. Weeks of supply 49 ÷ 42 = **1.2**.

Your turn. Daily sales _____ Lead time _____ Safety _____ Reorder point _____

7. Your Paycheck

Hours, overtime, commission and labor cost.

- **Pay** = hours × rate. **Decimal hours** = hours + minutes ÷ 60 (8 h 45 min = 8.75 h).
- **Paid hours** = end − start − unpaid meal break. Short rest breaks an employer gives are paid (federal rule).
- **Overtime** (federal): hours over 40 in a workweek at 1.5 × the regular rate. Your state may set more.
- **Commission** = rate × sales. **Tiers:** each rate applies only to the sales in its band. **A draw** pays at least the draw.
- **Effective hourly** = total pay ÷ hours. **Labor %** = labor cost ÷ net sales × 100.
- **Employee discount** comes off before tax (in this example).

> **Worked example (Chapter 7).** Nia works 9:30 a.m. to 6:00 p.m. with a 30-minute unpaid meal: 8.5 − 0.5 = **8.0 hours** × $17.50 = **$140.00**. A 46-hour holiday week: 40 × $17.50 = $700.00, plus 6 × $26.25 = $157.50, total **$857.50**. Imani: 36 × $13.00 = $468.00 + 4% of $9,250 = $370.00 → **$838.00**, $23.28 an hour.

Your turn. Hours _____ Rate _____ Overtime hours _____ Pay _____

Planning Sheet 1: Drawer Count Sheet

Count twice. Write it down before you talk to anyone.

Kind	Count	Value	Kind	Count	Value
$100			Quarters		
$50			Dimes		
$20			Nickels		
$10			Pennies		
$5			Rolled coins		
$1			Checks / other		
Total					

Close the till	Amount
Opening float	
+ Cash taken in	
– Cash refunds	
– Paid-outs	
= Expected in the drawer	
Counted	
Over (+) / short (–) (counted – expected)	
Deposit (counted – float)	

Counted by _____ Checked by _____ Date _____

Planning Sheet 2: Register & Discount Card

Keep it by the register. Tax rate here: _____%

Line	**Amount**
Subtotal	
– Percent off (____%)	
– Coupon	
= Taxable amount	
+ Tax (taxable × rate, to the cent)	
= Total	
Handed over	
Change	

$X off or p% off? The percent wins on baskets over X ÷ p = $_____.

Two discounts in a row: (1 − ____) × (1 − ____) = _____ of the price → _____% off.

A refund: price on the original receipt $_____ + its tax $_____ = $_____.

Planning Sheet 3: Markup & Margin Sheet

Price new arrivals the same way every time.

Item	Cost	Target margin	Cost ÷ (1 – m)	Price (ending)	Margin	Markup

Freight for the order $_____ ÷ units _____ = $_____ a unit to add to cost (landed cost).

Planning Sheet 4: Markdown Worksheet

Before the sign goes up: what's left for the store?

Item	Cost	Was	1st off	Sale	2nd off	Final	% off	Margin

Promo break-even: regular gross profit $_____ × _____ units = $_____; ÷ promo gross profit $_____ = _____ units (round up).

Planning Sheet 5: Shift Report

Line	**Number**
Net sales (before tax)	
Target · **% to target**	
Same day last year · **change**	
Hours open · **sales per hour**	
Transactions · **average sale**	
Units · **units per transaction**	
Door count · **conversion**	
Staff hours · **sales per labor hour**	
Labor cost · **labor %**	
Sales tax collected	

Pace check at _____: sales so far $_____; (target – so far) ÷ hours left = $_____ an hour needed.

Planning Sheet 6: Reorder Sheet

Item	A day	Lead (days)	Safety	Reorder pt	On hand	Up to	Case	Cases

Reorder point = sells a day × lead time + safety. Cases = (order up to − on hand − on order) ÷ case size, **rounded up**.

Count: book $_____ − counted $_____ = shrink $_____ = _____% of sales $_____.

Planning Sheet 7: Time Sheet & Paycheck Check

Day	Start	End	Unpaid meal	Paid hours
Mon				
Tue				
Wed				
Thu				
Fri				
Sat				
Sun				
Week				

Pay check	Amount
Hours up to 40 × rate	
Hours over 40 × 1.5 × rate	
Commission (each tier on its band)	
Gross pay	
Gross pay ÷ hours = **effective hourly**	
Gross on my pay stub	
Difference (ask about anything over a few cents)	