The Teen Math Workout

Printable Toolkit — Seven Cheat Sheets and Four Planning Sheets

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Math Didn’t Have to Be This Hard: The Workout Series · Book 6

How to Use This Toolkit

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

- **Seven cheat sheets**, one for each chapter. Every rule is the same one the chapter teaches, plus one worked example taken straight from the book.
- **Four planning sheets** to fill in with your own numbers: a weekly timesheet, a one-month budget, a savings-goal tracker, and a move-in checklist.

Print as many copies as you like. Keep a cheat sheet in your bag, a budget on the fridge, and a timesheet in your work locker.

The numbers in the examples are invented for practice, just as they are in the book. Real rates, taxes and rules vary by state and change over time. This toolkit is for learning; it is not financial, tax, legal or employment advice.

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

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

1. Money Moves

Decimals, rounding and making change: the habits behind every purchase.

- **Dollars and cents:** in $4.25, the first digit after the point counts dimes and the second counts pennies.
- **Add and subtract:** line up the decimal points. Write every price with two digits after the point ($3 = $3.00).
- **99¢ trick:** 3 × $2.99 = (3 × $3) − 3¢ = $8.97.
- **Making change:** count up from the price to the amount paid. The hops are the change.
- **Nearest dollar:** 50¢ or more rounds up; under 50¢ rounds down.
- **Do I have enough?** Round every price *up* to the next dollar. If that fits, the real total fits.
- **Splitting a bill:** total ÷ people, then round each share *up* to the next cent.

> **Worked example (Chapter 1, Example 4).** Your total is $13.65 and you pay with a $20 bill. Count up: + 10¢ → $13.75, + 25¢ → $14.00, + $1 → $15.00, + $5 → $20.00. Change: 10¢ + 25¢ + $1 + $5 = **$6.35**. Check: $20.00 − $13.65 = $6.35.

Your turn. Total _____ Paid with _____
Hops _____ Change _____

2. Percent Power

Discounts, sales tax and tips, done with one multiplication each.

- **Percent means "per hundred":** 25% = 0.25. Move the point two places left (8% = 0.08).
- **Mental math:** 10% → point one place left. 5% = half of 10%. 20% = double 10%. 15% = 10% + 5%. 1% → point two places left.
- **Percent of a number:** part = percent (as a decimal) × whole. 30% of $60 = $18.
- **Sale price:** price × (1 − discount). 25% off → × 0.75.
- **Total with tax:** price × (1 + tax rate). 8% tax → × 1.08.
- **Tips:** figure the tip on the bill *before* tax.
- **Stacked discounts multiply:** 30% off, then 20% off → × 0.70 × 0.80 = × 0.56. That's 44% off, not 50%.
- **Working backward:** original price = sale price ÷ the multiplier. $42 after 30% off → $42 ÷ 0.70 = $60.
- **Percent change:** (new − old) ÷ old × 100.

> **Worked example (Chapter 2).** An $80 rain jacket is 30% off, and the register takes an extra 20% off the sale price. $80 × 0.70 = $56.00, then $56.00 × 0.80 = **$44.80**. As one multiplier: 0.70 × 0.80 = 0.56, so you pay 56%: **44% off**, not 50%.

Your turn. Price _____ Multipliers _____
You pay _____ Real discount _____

3. Your First Paycheck

From the clock on the wall to the money in your account.

- **Hours worked:** clock-out time − clock-in time − any unpaid break.
- **Minutes to decimal hours:** divide by 60. 15 min = 0.25 h, 30 min = 0.5 h, 45 min = 0.75 h. So 6 h 45 min = 6.75 h, never 6.45 h.
- **Gross pay:** hours × hourly rate (+ tips, if your job has them).
- **Pay periods:** weekly = 52 paychecks a year, biweekly = 26, twice a month = 24, monthly = 12.
- **Overtime:** for covered, non-exempt employees, at least 1.5 × the regular rate for every hour over 40 in a workweek.
- **FICA:** Social Security 6.2% + Medicare 1.45% = 7.65% of gross pay for most employees.
- **Income-tax withholding:** set aside toward your income tax, based on the form you fill out when you're hired. Different for everyone.
- **Net pay:** gross pay − all deductions.
- **Real hourly rate:** (pay − work costs like fares) ÷ (hours worked + travel time).

> **Worked example (Chapter 3, Example 5).** 30 hours at $14: gross $420.00. Social Security 6.2% = $26.04. Medicare 1.45% = $6.09. Federal withholding (given) $12.00. State tax 2% in this example = $8.40. Net: $420.00 − $26.04 − $6.09 − $12.00 − $8.40 = **$367.47**.

4. Budgeting & Saving

Make a plan, then hit the goal.

- **What's left over:** income − spending.
- **The 50/30/20 guideline:** 50% needs, 30% wants, 20% savings. A starting point, not a rule.
- **Percent of income:** part ÷ income × 100.
- **Weeks to a goal:** (goal − already saved) ÷ amount saved per week. Always round *up* to a whole week.
- **Sinking fund:** cost ÷ number of weeks or months until it's due.
- **Yearly cost of a habit:** daily cost × 365, or cost × days per week × 52.
- **Simple interest:** interest = principal × rate × years ($I = P \times r \times t$).
- **Compound interest, once a year:** total = $P \times (1 + r)^{years}$. **Monthly:** use r ÷ 12 and multiply once per month.
- **Rule of 72:** years to double ≈ 72 ÷ the yearly rate (6% → about 12 years).

> **Worked example (Chapter 4, Example 3).** Maya's laptop costs $650. She has $110 saved and puts away $40 a week. Still needed: $650 − $110 = $540. $540 ÷ $40 = 13.5, so round up: **14 weeks**. After 13 weeks she has $630 (still $20 short); after 14 weeks, $670.

5. True Cost

What a phone, a subscription or a car really costs.

- **Unit price:** price ÷ number of units. Compare two options in the *same* unit.
- **Cost per use:** price ÷ number of times you'll use it.
- **Monthly to yearly:** × 12. **Weekly to yearly:** × 52.
- **Total cost of a phone deal:** phone price + (monthly plan × number of months).
- **Break-even between two plans:** break-even units = (flat price – base fee) ÷ per-unit charge.
- **Fuel:** gallons = miles ÷ mpg. Fuel cost = gallons × price per gallon.
- **True monthly cost of a car:** fuel + insurance + upkeep + (yearly fees ÷ 12), plus any loan payment.
- **Cost per mile:** total cost ÷ miles driven.

> **Worked example (Chapter 5).** Plan A is $15 a month plus $2 per GB; Plan B is $35, unlimited. The gap is $35 − $15 = $20, and $20 ÷ $2 = **10 GB**. Check: Plan A at 10 GB = $15 + (10 × $2) = $35. Below 10 GB, Plan A is cheaper; above it, Plan B is.

6. Credit & Borrowing

What borrowing really costs, before you sign.

- **Principal:** the amount you borrow. **Interest:** the extra you pay for borrowing it. **Term:** how long you take to pay it back.
- **APR:** the yearly cost of borrowing, as a percent.
- **Simple interest:** principal × rate × time (in years). 6 months = 0.5 years.
- **Monthly rate:** APR ÷ 12. A 24% APR is 2% a month.
- **One month of card interest (simplified):** balance × APR ÷ 12. Most cards use a daily rate, but this gets you very close.
- **Pay in full, pay no interest:** paying the whole statement balance by the due date usually means no interest on purchases.
- **Payment plans:** total paid = payment × number of payments. Interest = total paid – amount borrowed.
- **Credit utilization:** balance ÷ credit limit × 100. Many experts suggest staying under 30%.

> **Worked examples (Chapter 6, Examples 1 and 2).** Priya borrows $500 for one year at 8% simple interest: $500 × 0.08 × 1 = **$40**, so she pays back $540. Jordan's card has a $1,000 limit and a $240 balance: $240 ÷ $1,000 × 100 = **24%** utilization.

7. Your First Apartment

Rent, roommates and room sizes.

- **Area of a rectangle:** length × width, in square feet (ft²). A 12 ft × 11 ft room is 132 ft².
- **L-shaped room:** split it into two rectangles and add, or take the big rectangle and subtract the missing corner.
- **Rent per square foot:** monthly rent ÷ area.
- **The 30% guideline:** rent ≤ 0.30 × gross monthly income.
- **The 40× screen many landlords use:** yearly gross income at least 40 × the monthly rent (the same line as 30%).
- **Move-in cash:** first month's rent + security deposit + fees + moving costs.
- **Splitting rent by room size:** rent per ft² × your bedroom's area, plus an equal share of the shared space.
- **Reading a ¼-inch plan:** plan inches × 4 = real feet. Real feet ÷ 4 = plan inches.

> **Worked example (Chapter 7, Example 4).** A 1,000 ft² apartment rents for $2,100: $2.10 per ft². Sam's 132 ft² bedroom: 132 × $2.10 = $277.20. The 660 ft² shared space: 660 × $2.10 = $1,386, or $462 each for three. Sam pays $277.20 + $462 = **$739.20**.

Planning Sheet A: My Weekly Timesheet

Fill in one row per shift. Hours = out − in − unpaid break, in decimal hours (45 min = 0.75 h).

Day	Clock in	Clock out	Unpaid break	Hours	Notes
Mon					
Tue					
Wed					
Thu					
Fri					
Sat					
Sun					
			Total hours		

Hourly rate _____

Overtime hours (over 40, if they apply) × rate × 1.5 _____

Gross pay (hours × rate + overtime + tips) _____

Social Security + Medicare (gross × 0.0765) _____

Income-tax withholding (from your stub) _____

Other deductions _____

Net pay (gross − all deductions) _____

Does it match my pay stub? _____

Planning Sheet B: My One-Month Budget

Start from your take-home pay for the month, then give every dollar a job. The 50/30/20 targets are a starting point; adjust them to your life.

Take-home pay this month _____

Needs target (take-home × 0.50) _____

Wants target (take-home × 0.30) _____

Savings target (take-home × 0.20) _____

Item	Need / want / save	Planned	Actual
Totals			

Left over (take-home − actual spending) _____

Savings as % of take-home (savings ÷ take-home × 100) _____

Planning Sheet C: My Savings Goal

Weeks to the goal = (goal − already saved) ÷ weekly saving, rounded **up**. Tick a box each week you save. Longer goal? Start a second sheet at week 51.

What I'm saving for _____

Goal amount _____

Already saved _____

Still needed (goal − saved) _____

I can save each week _____

Weeks needed (still needed ÷ weekly, round up) _____

Target date _____

☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11	12	13	14	15	16	17	18	19	20
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
21	22	23	24	25	26	27	28	29	30
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
31	32	33	34	35	36	37	38	39	40
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
41	42	43	44	45	46	47	48	49	50

Halfway point (goal ÷ 2) reached on _____

Goal reached on _____

Planning Sheet D: My Move-In Checklist

Run all three checks before you sign. They are guidelines, not laws: they show where money is tight.

Address or listing _____

Monthly rent (my share) _____

My gross monthly income _____

Check 1 — the 30% guideline

0.30 × gross monthly income _____

Is my rent at or under that? (yes / no) _____

Check 2 — the 40× screen

40 × monthly rent _____

My yearly gross income (12 × monthly) _____

Is my income at or above that? (yes / no) _____

Check 3 — the move-in fund

First month's rent _____

Security deposit _____

Application and other fees _____

Moving costs (truck, boxes, my share) _____

Move-in cash total _____

In my move-in fund _____

Left after move-in (fund − total) _____