ALGEBRA: MULTI-STEP LINEAR EQUATIONS (COSTS)

Best Guess Mastery Worksheet (Target Grade 3/4)

I Do

In a stationery shop:
4 notebooks cost €6.80
3 notebooks and 5 pens cost €11.35

Doug buys 1 pen.

Work out the cost of one pen.

We Do

In a home goods store:
6 mugs cost ¥2400
2 mugs and 4 plates cost ¥3200

Paige buys 1 plate.

Work out the cost of one plate.

ALGEBRA: MULTI-STEP LINEAR EQUATIONS (COSTS)

Best Guess Mastery Worksheet (Target Grade 3/4)

You Do 1

At a market stall:
8 apples cost ₹320
5 apples and 6 bananas cost ₹380

Darren buys 1 banana.

Work out the cost of one banana.

You Do 2

In a clothing store:
3 t-shirts cost 45.00 CHF
2 t-shirts and 3 pairs of socks cost 51.00 CHF

Emily buys 1 pair of socks.

Work out the cost of one pair of socks.

ALGEBRA: MULTI-STEP EQUATIONS (ADVANCED MIXED SKILLS)

Best Guess Mastery Worksheet (Target Grade 5/6)

Challenge 1 (Equations & Ratio)

In a cafe:
4 coffees cost £10.00
3 coffees and a number of teas cost £15.50

The ratio of the price of a coffee to the price of a tea is 5 : 4.

How many teas did Ryan buy?

Challenge 2 (Exchange Rates & Percentages)

In a bookstore:
6 magazines cost $24.00
2 magazines and 5 books cost $53.00

Sarah wants to buy 1 book. She has £6.00 in cash.
The exchange rate is £1 = $1.25
Sarah also has a voucher that gives her a 20% discount on the book.

Does Sarah have enough money to buy the book?
You must show all your working clearly.

ALGEBRA: MULTI-STEP EQUATIONS (ADVANCED MIXED SKILLS)

Best Guess Mastery Worksheet (Target Grade 5/6)

Challenge 3 (Percentage Change)

At a restaurant this year:
5 pizzas cost €45
3 pizzas and 4 burgers cost €51

Next year, the price of a pizza will increase by 15% and the price of a burger will increase by 10%.

Steve plans to buy 2 pizzas and 2 burgers next year.
Work out the percentage increase in the total cost of Steve's meal compared to this year.

Challenge 4 (Reverse Percentages)

In a homeware sale, everything is reduced by 20%.

Alan buys 4 lamps in the sale for ¥4800
He also buys 2 lamps and 3 mirrors in the sale for ¥6600

Work out the normal (pre-sale) price of one mirror.

ALGEBRA: MULTI-STEP EQUATIONS (ADVANCED MIXED SKILLS)

Best Guess Mastery Worksheet (Target Grade 5/6)

Challenge 5 (Ratio Quantities)

Emma buys some apples and pears. She buys 15 items in total.
The ratio of the number of apples to the number of pears she buys is 3 : 2.

5 apples cost 6.00 CHF.
The total cost of Emma's 15 items is 22.80 CHF.

Work out the cost of one pear.

Challenge 6 (Synoptic: Ratio, Percent, Exchange)

At a theme park:
7 adult tickets cost £84
2 adult tickets and 3 child tickets cost £45

Peter buys adult and child tickets in the ratio 2 : 5. He buys 14 tickets in total.
He has a voucher that gives him 15% off the total price.

Peter pays for the tickets in Euros (€). The exchange rate is £1 = €1.20.

Work out how much Peter pays in Euros.

Answers & Worked Solutions

I Do:

1. Find cost of notebook: 6.80 ÷ 4 = €1.70.
2. Substitute into second equation: 3(1.70) + 5 pens = 11.35 → 5.10 + 5 pens = 11.35.
3. Find cost of 5 pens: 11.35 − 5.10 = 6.25.
4. Find cost of 1 pen: 6.25 ÷ 5 = **€1.25**

We Do:

1. Find cost of mug: 2400 ÷ 6 = ¥400.
2. Substitute: 2(400) + 4 plates = 3200 → 800 + 4 plates = 3200.
3. Find cost of 4 plates: 3200 − 800 = 2400.
4. Find cost of 1 plate: 2400 ÷ 4 = **¥600**

You Do 1:

1. Find cost of apple: 320 ÷ 8 = ₹40.
2. Substitute: 5(40) + 6 bananas = 380 → 200 + 6 bananas = 380.
3. Find cost of 6 bananas: 380 − 200 = 180.
4. Find cost of 1 banana: 180 ÷ 6 = **₹30**

You Do 2:

1. Find cost of t-shirt: 45 ÷ 3 = 15 CHF.
2. Substitute: 2(15) + 3 socks = 51 → 30 + 3 socks = 51.
3. Find cost of 3 socks: 51 − 30 = 21.
4. Find cost of 1 pair of socks: 21 ÷ 3 = **7 CHF**

Challenge 1:

1. Coffee price: 10.00 ÷ 4 = £2.50.
2. Ratio C:T = 5:4. Tea price = (2.50 ÷ 5) × 4 = £2.00.
3. 3 coffees cost 3 × 2.50 = £7.50.
4. Cost of teas = 15.50 − 7.50 = £8.00.
5. Number of teas bought: 8.00 ÷ 2.00 = **4 teas**

Challenge 2:

1. Magazine price: $24 ÷ 6 = $4.00.
2. 5 books cost: $53 − 2(4) = $45 → 1 book = $9.00.
3. Apply 20% discount: $9.00 × 0.8 = $7.20 (Price she must pay).
4. Convert Sarah's cash to USD: £6.00 × 1.25 = $7.50.
5. Conclusion: **Yes**, she has enough ($7.50 is greater than $7.20).

Challenge 3:

1. Pizza price: 45 ÷ 5 = €9.
2. Burger price: (51 − 3(9)) ÷ 4 = (51 − 27) ÷ 4 = €6.
3. Current cost of 2P and 2B: 2(9) + 2(6) = 18 + 12 = €30.
4. New prices: Pizza = 9 × 1.15 = €10.35. Burger = 6 × 1.10 = €6.60.
5. New cost of 2P and 2B: 2(10.35) + 2(6.60) = 20.70 + 13.20 = €33.90.
6. Percentage increase: (33.90 − 30) ÷ 30 × 100 = (3.90 ÷ 30) × 100 = **13%**

Challenge 4:

1. Sale price of lamp: 4800 ÷ 4 = ¥1200.
2. Sale price of 3 mirrors: 6600 − 2(1200) = 6600 − 2400 = 4200.
3. Sale price of 1 mirror: 4200 ÷ 3 = ¥1400.
4. Reverse percentage (Sale price is 80% of normal): Normal = 1400 ÷ 0.8 = **¥1750**

Challenge 5:

1. Total ratio parts = 3 + 2 = 5. Items per part = 15 ÷ 5 = 3.
2. Emma buys: Apples = 3 × 3 = 9. Pears = 2 × 3 = 6.
3. Apple price: 6.00 ÷ 5 = 1.20 CHF.
4. Cost of 9 apples: 9 × 1.20 = 10.80 CHF.
5. Cost of 6 pears: 22.80 − 10.80 = 12.00 CHF.
6. Cost of 1 pear: 12.00 ÷ 6 = **2.00 CHF**

Challenge 6:

1. Adult ticket price: 84 ÷ 7 = £12.
2. Child ticket price: (45 − 2(12)) ÷ 3 = (45 − 24) ÷ 3 = £7.
3. Total ratio parts = 2 + 5 = 7. Tickets per part = 14 ÷ 7 = 2.
4. Peter buys: Adult = 4. Child = 10.
5. Pre-discount cost: 4(12) + 10(7) = 48 + 70 = £118.
6. Apply 15% discount: 118 × 0.85 = £100.30.
7. Convert to Euros: 100.30 × 1.20 = **€120.36**