Limes for Sale

Multi-Step Problems

Sample Problem

Carmelita Huevos bought 360 limes for ③ $175.00. ~~Since the temperature during rainy season had averaged 78 degrees Fahrenheit, the limes were 50% bigger than they were the last year.~~ She packed the limes in small, green bags of ① 3 limes each. She gave them to her brother, Jose, and he sold all the bags of limes at ② $3.00 per bag. How much money did she make?

① $\frac{360 \text{ limes}}{3 \text{ limes per bag}} = 120 \text{ bags}$

② $\frac{120 \text{ bags}}{1} \times \frac{\$3}{\text{bag}} = \$360$

③ $\$360 - \$175 = \$185$

Carmelita made $185 (profit).

Why this works:

360 limes ÷ 3 limes per bag:

$360 \text{ limes} \div \frac{3 \text{ limes}}{1 \text{ bag}}$

Dividing by a fraction is the same thing as multiplying by the reciprocal....

$\frac{360 \text{ limes}}{1} \times \frac{1 \text{ bag}}{3 \text{ limes}}$

$\frac{360}{3} \text{ bags} = 120 \text{ bags}$

Practice Problem #1

Akbar ~~was starting to panic. When he had~~ purchased the 120 acres of forest for the Big Project, he hadn't done his research. Now, the night before the Big Project broke ground, he finds out that ① 2/3 of the trees in the forest housed endangered pygmy flying squirrels, and he wouldn't be able to use them. Akbar knew that only ② 100 trees grew on each acre, and that this new development wouldn't leave him with enough trees. ~~When his cell phone rang, he knew it was Big Jimmy calling to find out how many trucks he'd need to haul away the harvested trees.~~ If Big Jimmy's trucks can carry ③ 50 trees per truck, how many trucks will Akbar need to remove the trees he can cut down for the Big Project?

① Akbar can NOT use 2/3 of the trees.

$$\frac{2}{3} \text{ of } 120 \text{ acres} = \frac{2}{3} \times 120 \text{ acres} = \frac{240 \text{ acres}}{3} = 80 \text{ acres}$$

120 acres – 80 acres = 40 acres of trees (that he WILL use)

② 40 acres, 100 trees on each acre

$$\frac{40 \text{ acres}}{1} \times \frac{100 \text{ trees}}{1 \text{ acre}} = \frac{4{,}000 \text{ trees}}{1} = 4{,}000 \text{ trees}$$

③ 4,000 trees, 50 trees per truck

$$\frac{4{,}000 \text{ trees}}{1} \div \frac{50 \text{ trees}}{1 \text{ truck}}$$

$$\frac{4{,}000 \text{ trees}}{1} \times \frac{1 \text{ truck}}{50 \text{ trees}} = \frac{4{,}000}{50} \text{ trucks} = \boxed{80 \text{ trucks}}$$

OR:

$$\frac{4{,}000 \text{ trees}}{50 \text{ trees per truck}} = 80 \text{ trucks}$$

Practice Problem #2

~~It was finally the first sunny day Monty Chaney had seen in weeks. The sunshine meant that Paul, the owner of Four Burly Boys Concrete Company, would bring his crew to finish the concrete work around Monty's house.~~ That day, Austin poured a patio slab that measured 10 yards by 30 yards, while his brother, Brian, poured a sidewalk that measured 30 yards by 2 yards. Out front, Adam finished the driveway which measured 15 yards by 18 yards. At the end of the day, Monty paid Paul $3,010 for the work, and Paul paid his workers $3 for each square yard of concrete that they poured. How much money did Paul have left over at the end of the day?

Think Backward: Money left over → Total – what he paid his workers

Workers are paid by the square yard, so how many square yards did each pour?

① How many square yards did each worker pour?

Worker	Measurements	Area Poured
Austin	10 yd x 30 yd	= 300 yd^2
Brian	30 yd x 2 yd	= 60 yd^2
Adam	15 yd x 18 yd	= 270 yd^2

② Paul paid $3 for each square yard...

Worker	Area Poured	x	$3 per square yard	=	Total $ earned
Austin	$\frac{300\ yd^2}{1}$	x	$\frac{\$3}{1\ yd^2}$	=	$900
Brian	$\frac{60\ yd^2}{1}$	x	$\frac{\$3}{1\ yd^2}$	=	$180
Adam	$\frac{270\ yd^2}{1}$	x	$\frac{\$3}{1\ yd^2}$	=	+ $810
				Total paid:	$1,890

③ Monty paid $3010, how much did Paul have left over?

$3010 – $1,890 = **$1120 left over**

Alternate Way to Solve:
Add the total square yards after Step 1 (= 630 yd^2). Then multiply that figure by $3 per square yard: 630 yd^2 x $3 per yd^2 = $1,890

Practice Problem #3

~~Ben Beagle smiled contentedly as he reached for the bank's door. He had just wrapped up the most successful week in Canine Aquatic Temple (C.A.T.) history.~~ On Monday, the C.A.T. had opened its doors at 8 a.m. By the end of the day, there had been a record 427 visitors! Tuesday through Friday had seen daily ① attendance decreases by exactly 12 visitors each day, compared to the previous day. With ② each visitor paying an entrance fee of $1.25, Ben Beagle now had an enormous amount of money. ~~But unbeknownst to Ben, had just stepped into the middle of a bank robbery in progress.~~ Five flying squirrels, ~~wearing tunics made out of what appeared to be dish towels, stood at the counter, brandishing rubber-band guns. Once they saw Ben, the squirrels~~ snatched the money from Ben's grasp, and exited the bank in a flash. ③ If the squirrels split the money equally, how much would each squirrel receive?

Think Backward: Split money equally ⟶ Total money ÷ 5 squirrels

Total money? ⟶ Each visitor paid $1.25, so how many visitors in all?

①

Day:	Number of Visitors:			
Monday	427			427
Tuesday	Mon. – 12	427 – 12	=	415
Wednesday	Tue. – 12	415 – 12	=	403
Thursday	Wed. – 12	403 – 12	=	391
Friday	Thurs. – 12	391 – 12	=	379
		Total Number of Visitors:		2,015

② Each visitor paid $1.25

2,015 x $1.25 = $2,518.75 total

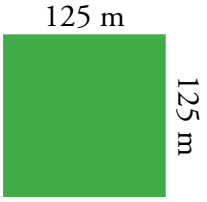
③ 5 squirrels split the money equally

$2,518.75 ÷ 5 squirrels = $503.75 per squirrel

Practice Problem #4

~~Old Man Jenkins waited impatiently by the mailbox. If it didn't come today, he would be in a pickle. That afternoon, the residents of Shady Acres would all gather at the local croquet field for the Biannual Crankypants Walk-a-thon.~~ Old Man Jenkins' sponsors had promised that for every kilometer he walked today, he would earn $57 to put towards this year's Senility Ball. But if his new cane didn't arrive soon, he wouldn't be able to walk even one of the square croquet field's 125 m sides. ~~Just as he thought all hope was lost, Babs' mail truck screeched to a halt in front of him, and she handed him a package from eBuy. The package measured 25 in by 5 in by 3 in and contained his fancy new cane!~~ Arriving at the field in the nick of time, Old Man Jenkins walked at a brisk pace and circled the entire field 8 times before the walk ended. How much money did Old Man Jenkins earn for the Senility Ball?

Think Backwards: How much money did he earn? ← ③ $57 per kilometer
How far did he walk? ← ② 8 times ① around a square croquet field that has 125 m sides



① **What is the perimeter of the croquet field?**

P = l + l + w + w
P = 125 m + 125 m + 125 m + 125 m = 500 m

...in kilometers? 1 km = 1000 m → divide by 10^3 or 1000*
500 m ÷ 1000 = 0.5 km The perimeter is 0.5 km.

② **8 times around the perimeter**

8 x 0.5 km = 4 km He walked 4 km in all.

③ **$57 for every kilometer, 4 km in all**

$$\frac{\$57}{1\ \cancel{km}} \times \frac{4\ \cancel{km}}{1} = \$228 \text{ total profit}$$

*See the "Unit Conversions in the Metric System" instruction in the Tool Kit for more information.

Practice Problem #5

~~The penguins at the Gubba Bump Fish Company were exhausted. The guy in the red suit was working their flippers to the cartilage. There were no happy feet on the ice that day, yet they persevered.~~ The waddle of penguins diligently stuffed ① 10 fish in every box—no exceptions. At the end of the day, the guy in the red suit sailed away with a ship packed with 488 boxes of fish. He promised to sell as many individual fish ② as he could and send ④ 3/8 of the proceeds back to the penguins. If the guy in the red suit ② sells 7/8 of the fish for ③ $2 each, how much will the penguins earn for their hard labor?

Since we know the price of each individual fish, we'll need to figure out how many individual fish there were in all, and how many of those fish he actually sold.

① 10 fish in every box, 488 boxes

$$\frac{10 \text{ fish}}{1 \text{ box}} \times \frac{488 \text{ boxes}}{1} = \frac{4{,}880 \text{ fish}}{1} = 4{,}880 \text{ total individual fish}$$

② He sold 7/8 of all the fish: 7/8 of 4,880 fish = number of fish sold

$$\frac{7}{8} \times \frac{4{,}880 \text{ fish}}{1} = \frac{34{,}160}{8} \text{ fish} = 4{,}270 \text{ fish sold}$$

③ 4,270 fish sold for $2 each

4,270 x $2 = $8,540 total profit

④ 3/8 of the profit back to the penguins

$$\frac{3}{8} \times \frac{\$8{,}540}{1} = \frac{\$25{,}620}{8} = \$3{,}202.50$$

The penguins earned $3,202.50 for their labor.