

Chapter Five

Money

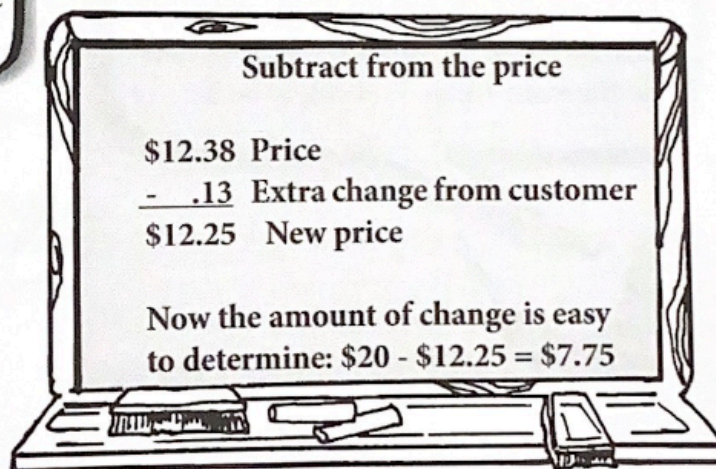
I work at a store after school and sometimes customers do something that confuses me. If they buy something for \$12.38, they will give me a 20-dollar bill and 13 cents. Why would they do that? Are they trying to be mean and confuse me?



I've had the same thing happen to me. If the customer didn't do that, the change would be 2 quarters, a dime, and 2 pennies. He probably didn't want that kind of change to carry around.



Here is a quick way to figure out how to give change when someone gives you extra money.



Do the following problems without pencil and paper or a calculator:

- 1) The cost of a goldfish is \$7.87. The customer hands you a 10-dollar bill and 2 cents. What is the correct change?
- 2) Weightlifting ants cost \$9.82 each. The customer hands you a 20-dollar bill and 7 cents. What is the amount of change?
- 3) 3 weightlifting ants cost \$21.15. The customer hands you a 20-dollar bill, a 5-dollar bill and a quarter. What is the correct change?



I am going to Europe and I need to know how to change dollars into euros and euros into dollars.



One way to do this is to make two fractions. Let's say that one euro is equal to \$1.50 and you want to know how many euros you will get for \$30.



Fraction 1 Fraction 2

$$\frac{1 \text{ euro}}{\$1.50}$$

$$\frac{? \text{ euros}}{\$30}$$

Now ask yourself what you multiplied by or divided by to get from \$1.50 to \$30. When you think a little, you can see that you multiplied by 20. The next step is to be fair to the top of the fraction and do the same thing — multiply by 20.



Fraction 1

Fraction 2

$$\frac{1 \text{ euro}}{\$1.50}$$

(x 20)

$$\frac{? \text{ euros}}{\$30}$$

Fraction 1

Fraction 2

$$\frac{1 \text{ euro}}{\$1.50}$$

(x 20)

(x 20)

$$\frac{20 \text{ euros}}{\$30}$$

- 1) If one euro is equal to \$1.25, then how many euros would you receive for \$100?
- 2) If 35 euros are equal to \$50, how many euros are equal to \$10?
- 3) If one euro is equal to \$1.50, then what fraction of a euro is \$1 equal to?

Problem Set 1

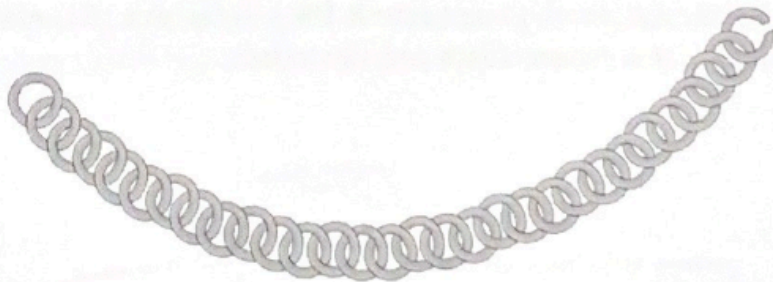
Warmup: If gold necklaces cost \$90 per meter, what is the cost of $2\frac{1}{2}$ meters of the necklace?

Level 1: If the price of a gold necklace is \$90 per meter, what is the cost of 5 decimeters of necklace?
(*Research needed*)

Level 2: If the price of a gold necklace is \$90 per meter, what is the cost of 10 centimeters of necklace? (*Research needed*)

Level 3: If the price of a gold necklace is \$90 per meter, what is the cost of 1 millimeter of necklace?
(*Research needed*)

Genius Level: If the price of a gold necklace is \$10,000 per meter, what is the cost of 1000 nanometers of gold necklace? (*Research needed*)

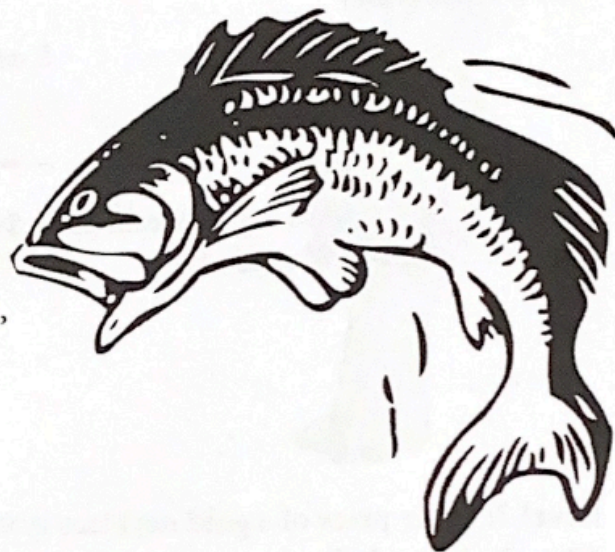


Problem Set 2

Warmup: If the price of three pounds of candy corn is \$21, what is the cost for each pound?

Level 1: Ice cream is priced at 4 scoops for \$5 or 3 scoops for \$4.50. How much money do you save per scoop of ice cream when you buy 4 scoops?

Level 2: If a pound and a half of salmon cost \$13.50, what does a pound of salmon cost?



Level 3: A soccer ball and shin guards together cost \$60. If the soccer ball is \$10 more than the shin guards, what is the cost of the soccer ball?

Genius Level: The charge to rent a car is \$80 per day plus 15 cents per mile driven. What is the cost to rent a car that is driven n days and 100 miles?

Problem Set 3

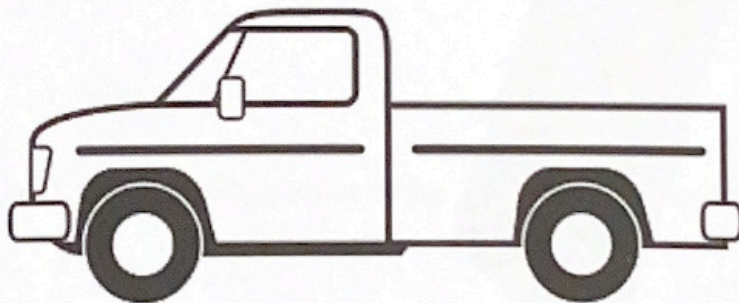
Warmup: If the price of gas is \$4 per gallon, what does it cost to fill an empty 15 gallon gas tank?

Level 1: If the price of gas is \$3.50 per gallon, what does it cost to fill an empty 20 gallon tank?

Level 2: If a car can go 25 miles on each gallon of gas, what will it cost to go on a 1000 mile trip if gas cost \$4 per gallon?

Level 3: If the price of gas is \$4.35 per gallon, how many miles would you be able to travel in a car that gets 23 miles per gallon if you had \$87 to spend on gas?

Genius Level: Laura currently drives a pickup truck that gets 12 miles per gallon of gas. She is thinking of selling her truck and buying a Prius that gets 50 miles per gallon of gas. If the price of gas is \$4 per gallon and Laura drives 15,000 miles in a year, how much money will she save on gas each year if she buys the Prius?



Problem Set 4

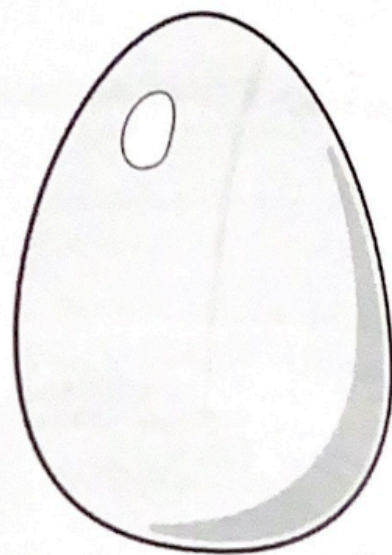
Warmup: If eggs cost \$1.20 per dozen, what is the cost of one egg?

Level 1: If 3 dozen eggs cost \$9.99, what is the cost of a dozen eggs?

Level 2: The cost of groceries was \$18.37. If the clerk is given a 20-dollar bill and 2 cents, what is the change?

Level 3: What is the total cost of 99 shirts that cost \$9.99 each?

Genius Level: A \$100 phone is full price on December 1st. Each day the price will be cut in half. On which day in December will the cost of the \$100 phone drop below \$1?



Problem Set 5

Warmup: Sara spent \$175 for 2 presents. If the cost of one present was \$55, how much did the second present cost?



Level 1: The weight of the world's largest giant sequoia is 2,500,000 pounds. If you paid \$2 per pound for the tree, what would it cost?



Level 2: If one euro is equal to 2 dollars, how many euros is one dollar equal to?

Level 3: A charge of .01 dollars per minute is how many times more expensive than a charge of .01 cents per minute?

Genius Level: If one euro is equal to \$1.25, what fraction of a euro is one dollar equal to?

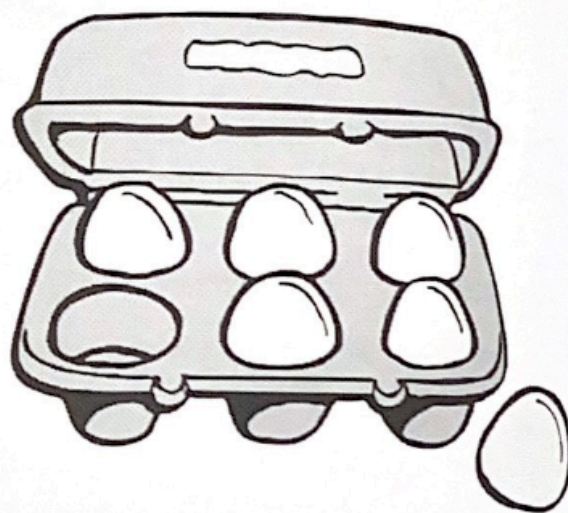
Money

Level 1

1) If the price of gas is \$4 per gallon, what does it cost to fill a 22-gallon tank?

2) A 4000 pound van cost \$24,000. What did the van cost per pound?

3) If 5 dozen eggs cost \$15, what did each egg cost?



4) If a gallon of milk costs \$4.80, what is the cost per quart?

5) It cost \$63 to fill an empty 18 gallon gas tank. What was the cost of the gas per gallon?

Money

Level 2

- 1) The cost for a cup of coffee is \$1.23. If the clerk is given \$2 and 3 pennies, what is the change?



- 2) A type of hybrid car can travel 50 miles for each gallon of gas. If the price of gas is \$4.50 per gallon, what would be the cost of gas for a 500-mile trip?

- 3) $1\frac{1}{4}$ pounds of bananas cost 75 cents. What did a pound of bananas cost?

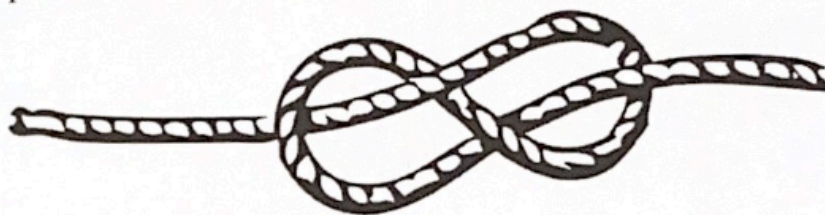
- 4) If gold is worth \$1850 per ounce, how much would a pound of gold be worth? (*Research needed*)

- 5) What is the value of a pile of money if it contains one of each bill from a \$1 bill to a \$100 bill?
(*Research needed*)

Money

Level 3

- 1) If $3\frac{1}{2}$ feet of rope cost 80 cents, how much did 14 feet of rope cost?



- 2) What is the total cost if Derrick bought a 99 cent pen, a book for \$9.99, a bike for \$99.99 and a computer for \$999.99?
- 3) If a cell phone company charges .01 dollars per minute, how many minutes would have to be used before the charge was one dollar?
- 4) If a car can go 40 miles on a gallon of gas and the price of gas is \$4 per gallon, what is the cost of gas per mile?
- 5) If gold costs \$1850 per ounce, how much would a ton of gold cost? (*Research needed*)



Money

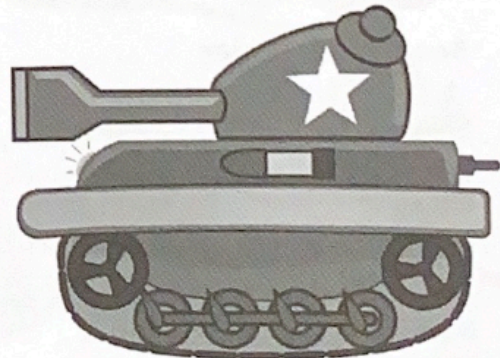
Genius Level

- 1) A Prius hybrid can travel 50 miles on a gallon of gas. A pickup truck can travel 15 miles on a gallon of gas. How much more will the cost of gas be for a 3000 mile trip if the pickup truck is driven instead of the Prius and the price of gas is \$4 per gallon?



- 2) If one United States dollar is worth 80 cents in Canadian money, how many United States dollars is one dollar of Canadian money worth?
- 3) If a cell phone company charges .001 cents per minute, how many minutes would have to be used before the charge was one dollar?
- 4) Gold is selling for \$1800 per ounce at Glen's Gold Shop. Keith's Gold By the Metric is selling gold for \$99 a gram. Which store has the better price? Explain your answer. (*Research needed*)

- 5) A tank can travel .6 miles per gallon of gas. If gas is \$3.75 per gallon, what would the cost of gas be to drive a tank from New York to Chicago? (The distance from New York to Chicago is 792 miles.)



Answers

Answers: Money

(Page 57)

1) \$2.15

2 cents lowers the cost to \$7.85

$$\$10 - \$7.85 = \$2.15$$

2) \$10.25

7 cents lowers the cost to \$9.75

$$\$20 - \$9.75 = \$10.25$$

3) \$4.10

Change from the quarter is 25 cents - 15 cents = 10 cents

Change from the 20-dollar bill and 5-dollar bill is $\$25 - \$21 = \$4$

(Page 58)

1) 80 euros

Fraction 1

Fraction 2

$$\begin{array}{r} 1 \text{ euro} \\ \$1.25 \end{array} \quad \times 80 = \begin{array}{r} ? \text{ euros} \\ \$100 \end{array}$$

$$1 \text{ euro} \times 80 = 80 \text{ euros}$$

2) 7 euros

Fraction 1

Fraction 2

$$\begin{array}{r} 35 \text{ euros} \\ \$50 \end{array} \quad (x \text{ or } \div) ? = \$10$$

$$\$50 \div 5 = \$10$$

$$35 \text{ euros} \div 5 = 7 \text{ euros}$$

3) $\frac{2}{3}$ of a euro

Fraction 1

Fraction 2

$$\begin{array}{r} 1 \text{ euro} \\ \$1.50 \end{array} \quad \times ? = \begin{array}{r} ? \text{ euros} \\ \$1 \end{array}$$

This is a little more difficult. What did you do to \$1.50 to get \$1? You took $\frac{2}{3}$ of it so $\frac{2}{3}$ of 1 euro = $\frac{2}{3}$ euro.

Problem Set 1 (Page 59)

Warmup: \$225

$$2.5 \times \$90 = \$225$$

Level 1: \$45

There are 10 decimeters in a meter. 5 decimeters is half of a meter. $\$90 \div 2 = \45

Level 2: \$9

There are 100 centimeters in a meter. 10 centimeters is $\frac{1}{10}$ of a meter. $\$90 \div 10 = \9

Level 3: 9 cents

There are 1000 millimeters in a meter. 1 millimeter is therefore $\frac{1}{1000}$ of a meter.
 $\$90 \div 1000 = \0.09 or 9 cents

Genius Level: 1 cent

There are 1 billion nanometers in a meter.

1 nanometer is therefore $\frac{1}{1,000,000,000}$ of a meter.

Cost per nanometer: $\$10,000 \div 1,000,000,000 = \0.00001 $\$0.00001 \times 1000 \text{ nanometers} = \0.01
 or 1 cent.

Problem Set 2 (Page 60)

Warmup: \$7

$$\$21 \div 3 = \$7$$

Level 1: 25 cents

$$\$5 \div 4 = \$1.25 \text{ per scoop} \quad \$4.50 \div 3 = \$1.50 \text{ per scoop}$$

Level 2: \$9

There are 3 half pound pieces in $1 \frac{1}{2}$ pounds of salmon.

$$\$13.50 \div 3 = \$4.50 \text{ per half pound or } 2 \times \$4.50 = \$9 \text{ per pound}$$

Level 3: \$35

Language of algebra:

Shinguards: n

Soccer ball: $n + \$10$

$$\text{Equation: } 2n + 10 = 60$$

$$2n = 50$$

$$n = 25 \quad \text{soccer ball} = 25 + 10 = \$35$$

Genius Level: $80n$ dollars + \$15

If the car was rented 5 days, the charge would be $5 \times \$80 + 15$ cents per mile.

The car was rented for n days and driven 100 miles:

$$n \times \$80 + 15 \text{ cents} \times 100$$

$$n \times 80 = 80n$$

$$15 \text{ cents} \times 100 = \$15$$

$$80n \text{ dollars} + \$15$$

Problem Set 3 (Page 61)**Warmup: \$60**

$$15 \text{ gallons} \times \$4 = \$60$$

Level 1: \$70

10 gallons would cost \$35 so 20 gallons would cost \$70

Level 2: \$160

1000 miles $\div$ 25 miles per gallon = 40 gallons of gas are needed

$$40 \text{ gallons} \times \$4 \text{ per gallon} = \$160$$

Level 3: 460 miles

\$87 would buy $\$87 \div \$4.35 = 20$ gallons of gas

$$20 \text{ gallons} \times 23 \text{ miles per gallon} = 460 \text{ miles}$$

Genius Level: \$3800

Cost of gas for the pickup truck: 15,000 miles $\div$ 12 miles per gallon = 1250 gallons used in a year.
 $1250 \text{ gallons} \times \$4 = \$5000$

Cost of gas for the Prius: 15,000 $\div$ 50 = 300 gallons of gas used in a year

$$300 \text{ gallons} \times \$4 = \$1200$$

$$\$5000 - \$1200 = \$3800$$

Problem Set 4 (Page 62)**Warmup: 10 cents**

$$\$1.20 \div 12 = 10 \text{ cents}$$

Level 1: \$3.33

$$\$9.99 \div 3 = \$3.33$$

Level 2: \$1.65

The 2 cents would lower the cost to an even \$18.35, which is easier to subtract from \$20.

$$\$20 - \$18.35 = \$1.65$$

Level 3: \$989.01

At \$10 each, the cost would be \$990. That is one cent too high for each shirt or 99 cents too high. $\$990 - 99 \text{ cents} = \989.01

Genius Level: December 8th

December 1: \$100

December 4: \$12.50

December 7: \$1.56

December 2: \$50

December 5: \$6.25

December 8: 78 cents

December 3: \$25

December 6: \$3.12

Problem Set 5 (Page 63)

Warmup: \$120

$$\$175 - \$55 = \$120$$

Level 1: \$5,000,000

$$\$2 \times 2,500,000 = \$5,000,000$$

Level 2: $\frac{1}{2}$ euro

If one euro is equal to 2 dollars, then each dollar must be equal to half a euro.

Level 3: 100 times

.01 dollars is one cent

.01 cents is $\frac{1}{100}$ of a cent

Genius Level: $\frac{4}{5}$ of a euro or .80 euro

One euro is equal to 5 quarters, so each quarter is equal to $\frac{1}{5}$ of a euro.

4 quarters are in a dollar $4 \times \frac{1}{5} = \frac{4}{5}$ or .8 euros

Level 1 (Page 64)**1) \$88**

$$\$4 \times 22 = \$88$$

2) \$6 per pound

$$\$24,000 \div 4000 = \$6$$

3) 25 cents

If 5 dozen eggs cost \$15, then each dozen cost $\$15 \div 5 = \3 . $\$3 \div 12 = \0.25 or 25¢

4) \$1.20

4 quarts in one gallon. $\$4.80 \div 4 = \1.20

5) \$3.50

$$\$63.00 \div 18 = \$3.50$$

Level 2 (Page 65)**1) 80 cents**

The 3 cents drops the cost of the cup of coffee to \$1.20.

$$\$2 - \$1.20 = 80 \text{ cents}$$

2) \$45

A 500 mile trip would use $500 \div 50 = 10$ gallons of gas. $10 \text{ gallons} \times \$4.50 \text{ per gallon} = \45

3) 60 cents

There are five $\frac{1}{4}$ pound parts in $1 \frac{1}{4}$ pounds of bananas so each $\frac{1}{4}$ pound part cost $75 \text{ cents} \div 5 = 15 \text{ cents}$

If $\frac{1}{4}$ pound cost 15 cents, then one pound cost $4 \times 15 = 60 \text{ cents}$.

4) \$29,600

There are 16 ounces in a pound.

$$16 \times \$1850 = \$29,600$$

5) \$188

$$1 + 2 + 5 + 10 + 20 + 50 + 100 = 188$$

Level 3 (Page 66)**1) \$3.20**

$2 \times 3 \frac{1}{2} = 7$ feet, so 7 feet of rope cost $2 \times 80 \text{ cents} = \1.60

If 7 feet of rope cost \$1.60, then 14 feet must cost $2 \times \$1.60 = \3.20

2) \$1110.96

Round all items up one cent: $\$1 + \$10 + \$100 + \$1000 = \$1111$

Each item is rounded up one cent, so the total is 4 cents too high.

$$\$1111 - 4 \text{ cents} = \$1110.96$$

3) 100 minutes

.01 dollars is equal to one cent.

4) 10 cents

$$\$4 \div 40 = \$.10 \text{ or } 10 \text{ cents}$$

5) \$59,200,000

There are 16 ounces in a pound and 2000 pounds in a ton.

This means there must be $16 \times 2000 = 32,000$ ounces in a ton

$$32,000 \times \$1850 = \$59,200,000$$

Genius Level (Page 67)

1) \$560

Gas used by the Prius: $3000 \text{ miles} \div 50 \text{ miles per gallon} = 60 \text{ gallons}$

Gas used by the pickup truck: $3000 \text{ miles} \div 15 \text{ miles per gallon} = 200 \text{ gallons}$

Cost of Prius gas: $60 \text{ gallons} \times \$4 = \$240$

Cost of pickup truck gas: $200 \text{ gallons} \times \$4 = \$800$ $\$800 - \$240 = \$560$

2) \$1.25

Because there are four 20-cent parts in 80 cents, each 20 cents of Canadian money is equal to 25 cents of United States money. One dollar of Canadian money has five 20-cent parts, so one Canadian dollar is equal to $5 \times 25 \text{ cents} = \1.25 of United States money.

3) 100,000 minutes

.001 cents is $\frac{1}{1000}$ of a cent, so the charge for 1000 minutes would be one cent.

One dollar is 100 cents 1000 minutes per cent

One dollar would be the charge for $100 \times 1000 \text{ minutes} = 100,000 \text{ minutes}$

4) Glen's Gold Shop

There are 28 grams in an ounce, so Keith's Gold By the Metric is selling gold at $28 \times \$99 = \2772 per ounce

5) \$4950

Find how many .6 mile pieces are in 792 miles.

$$792 \div .6 = 1320$$

One gallon each .6 mile piece, so 1320 gallons of gas are needed.

Cost: $1320 \times \$3.75 = \4950