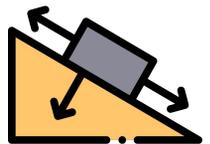




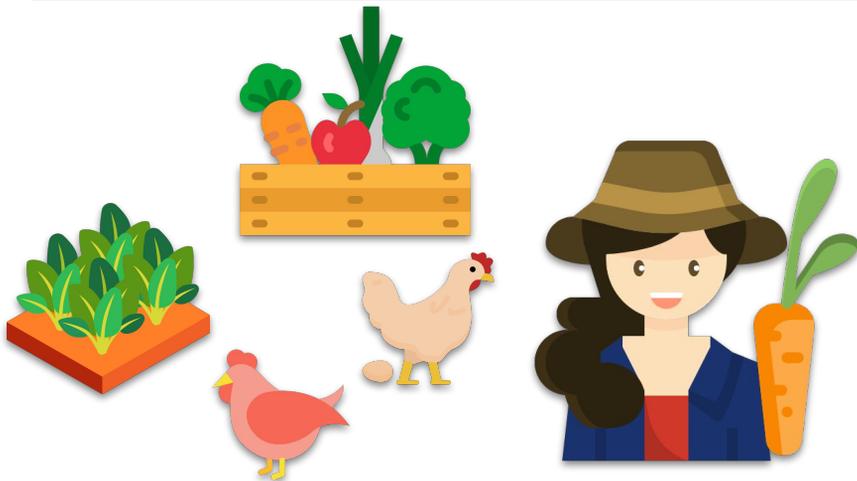
Helping With Math

Solving Word Problems Involving Rational Numbers

GRADE 7



We often encounter rational numbers in real life situations. For example, when buying fruits and vegetables in the market, counting the number of eggs harvested from the farm, the salary of the farmers and so on. Rational numbers are involved in these kind of situations.



Hello! I am Mara, welcome to my farm! Let me show you the different plants and animals in my farm.

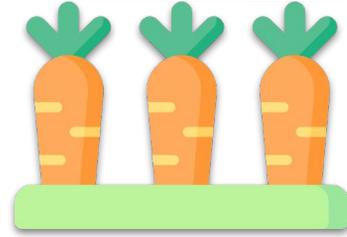
Identifying rational numbers can be easily done as long as we keep in mind that any number that can be transformed into a fraction such as $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{4}$ and so on is considered as rational number.



RATIONAL NUMBERS

RATIONAL NUMBERS

A rational number is a number that can be expressed as a fraction. It can also be represented by decimal numbers that are either terminating or repeating.

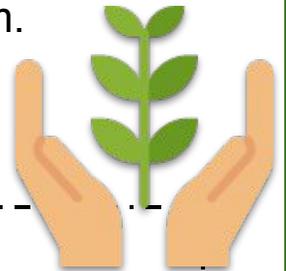


Characteristics of Rational Numbers:

- Rational numbers are infinite.
- Between two rational numbers there are infinite rational numbers.
- Rational numbers contain whole and natural numbers.
- It can be expressed in fraction or in decimal form.

Rational vs. Irrational

- Rational number is a number that can be expressed as a ratio of two integers while irrational number is a number that cannot be expressed that way.
- A number that has repeating and terminating decimal is a rational number while a number that has non-repeating and non-terminating decimal is an irrational number.



SOLVING WORD PROBLEMS



In solving word problems involving rational numbers, we should always apply PEMDAS rule:

P

Parentheses ; Any parts of the equation that are written inside a set of parentheses should be done first from the inside out.

E

Exponent ; Next step in solving is to evaluate the exponents.

M

Multiplication, Division ; The third step is to multiply and divide the terms in order as you read them from left to right.

D

A

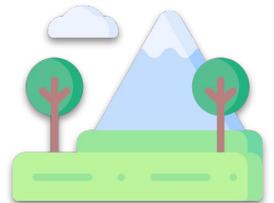
Addition, Subtraction ; The last step is the addition and subtraction of terms in order as you read them from left to right.

S

Example Problem

Mr. Howard bought 89-acre farmland at 20% discount. The original cost of the farmland is \$469, 920. How much is the cost per acre at a discounted price?

Solution:



Discount:

$$\$469, 920 \times 0.20 = \$93, 984$$

Discounted price of 89-acre land:

$$\$469, 920 - \$93, 984 = \$375, 936$$

Discounted price per acre:

$$\$375, 936/89 = \mathbf{\$4, 224/acre}$$



LET'S PRACTICE



Hi there! Help me solve the following problems below. Read and answer the problems carefully. Show your solution on the space provided.

1.) Julia bought 3 kilograms of apple at \$3/kg and 2 kilograms of banana at \$1.5/kg. What is the total cost that Julia spent?

Solution:



2.) Liza bought 4 kilograms of watermelon at \$1.2/kg and paid with one-hundred dollar bill. How much is her change?

Solution:

3.) Ryan bought chicken meat at the market at 22% discount. If he paid \$7.02, what is the original price of the meat?

Solution:

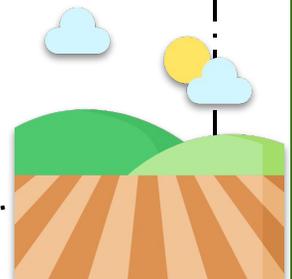


TABLE OF ACTIVITIES

- 1.) A Day At The Farm
- 2.) Growing Plants
- 3.) Harvest Time
- 4.) Fruits Everywhere
- 5.) Birdwatching
- 6.) Farmland Workers
- 7.) Crops At The Market
- 8.) Campfire At The Farm
- 9.) Sell Your Harvest
- 10.) Livestock Ranching

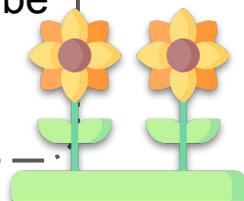


A DAY AT THE FARM

Do you want to get some fresh air? Let's go to the farm and enjoy the sunshine as well as the fresh air. Read the following statements. State whether the statement is true or false. Write your answer on the box provided.

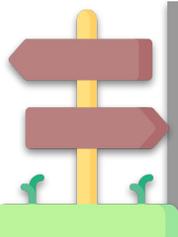
1

Rational numbers are numbers that cannot be expressed as the fraction of two integers.



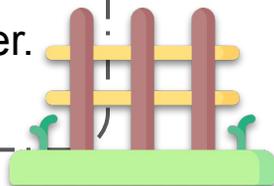
2

Numbers that have terminating and repeating decimals are considered rational numbers.



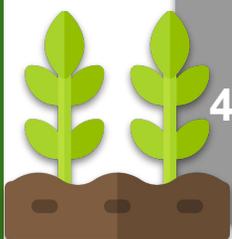
3

The number pi is an example of rational number.



4

Rational numbers can be expressed in the form of decimals.



5

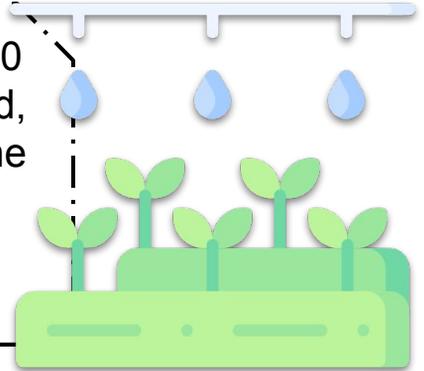
The number $\frac{1}{3}$ is an example of rational number.



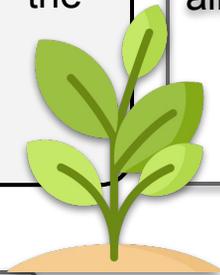
GROWING PLANTS

It's hard growing plants nowadays due to sudden change of weather. Let's help the farmers by reading and answering the problems below correctly. Show your solution.

1.) A delivery truck can hold a total of 600 sacks of rice. If $\frac{3}{4}$ of it was already filled, how many sacks of rice can still fit in the truck?

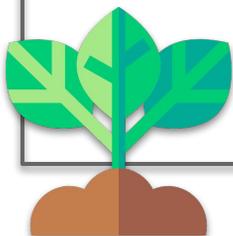


2.) A basket that contains bananas and apples weighs 6 kilograms. If the apple weighs 4.2 kilograms, what is the weight of the banana?



3.) You bought $\frac{1}{2}$ kilograms of banana in the morning and $\frac{2}{3}$ kilograms in the afternoon. How many kilograms did you buy in all?

4.) Ariel bought 12 horses and 18 cows. If he gave $\frac{1}{4}$ of his horses to his sister, how many animals does he have in all?



5.) There are 800 chickens in the poultry farm. If $\frac{3}{5}$ of it will be sold in the market, how many chicken will be left?



HARVEST TIME

After how many months of waiting, it's harvest time! Come on and let's help in harvesting the crops. Answer the following word problems below correctly. Show your solution.

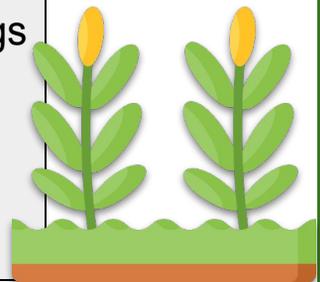
1.) If one bag of fertilizer can be used for 50 papaya trees, how many papaya trees can be fertilized with $2\frac{1}{2}$ bags of fertilizer?

2.) Jessa harvested a total of 560 kilograms of mangoes from her farm. She sold $\frac{7}{10}$ of it. If each kilogram of mango costs \$1.5, how much does she earned.

3.) Sheila needs to plant 30 tomato trees. If she already planted $\frac{9}{10}$ of what she needs to plant, how many trees does she still need to plant?

4.) Kaye can water 20 eggplant trees in 30 minutes. If she will work for $\frac{9}{2}$ hours, how many eggplant trees can she water?

5.) John owns a poultry with 300 laying hens. If $\frac{3}{4}$ of the hens lays 6 eggs each and the rest lay 4 eggs each, how many eggs John can harvest?



FRUITS EVERYWHERE

Yum! There's a lot of fruits around the farm! Let's pick and taste some if you answer the following word problems below. Read and answer them correctly. Show your solution on the space provided.

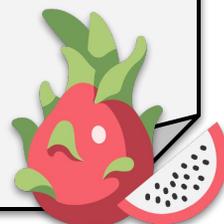


1.) Gino owns a huge farm. He has 360 animals in his farm, $\frac{1}{2}$ of which are carabaos, $\frac{1}{4}$ of which are goats and the rest are cows. How many carabaos, goats and cows are there in Gino's farm?

2.) A farm harvested $50 \frac{1}{4}$ sacks of corn on Monday, $65 \frac{1}{2}$ on Tuesday and $83 \frac{3}{4}$ on Wednesday. How many sacks of corn were harvested in total?

3.) Gilbert has 160 coconut trees in his farm. If $\frac{3}{10}$ of it bear 10 coconut fruits each tree and the rest bear 8 coconut fruits each tree, how many coconut fruits all the trees bear in total.

4.) Neri planted 2 coconut trees years ago. Now, one of the coconut trees has a height of $7 \frac{5}{9}$ meters and the other tree is $4 \frac{4}{7}$ meters. What is the height difference of the coconut trees?

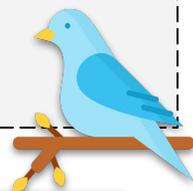


BIRDWATCHING

What a beautiful day to do birdwatching at the farm! Lots of birds are flying today. Let's watch them after answering the following problems below. Show your solution on the space provided.

1.) Janna harvested 16 boxes of oranges from her farm. If $\frac{1}{4}$ of it contains 45 oranges and the rest of the boxes contains 30 each, how many oranges did she harvest?

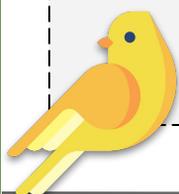
2.) You hired a man to water the plants in your farm. His rate is $\$2/30$ mins. If you will pay him a total of \$12, how many hours should he work?



3.) Rice costs \$1 per $\frac{1}{4}$ kilogram. How many kilograms can you buy if you have \$8?

4.) Dom earns \$1200 monthly in managing his farm. He spends $\frac{3}{4}$ of his earnings for his necessities and the rest for his savings. How much is his monthly saving?

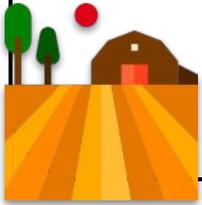
5.) Your family owns a 8-hectare farmland. $\frac{7}{12}$ of the farmland will be given to you. How many hectares will be given to you?



FARMLAND WORKERS

Let us appreciate the farmland workers for all their hard work. Give them rewards by answering the following problems correctly. Show your solution on the space provided.

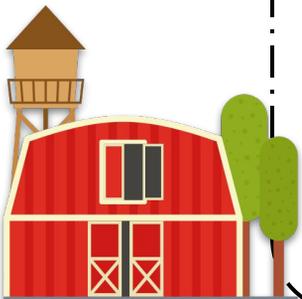
1.) Kat harvested a total of 320 eggs from her poultry farm. If $\frac{3}{10}$ of it was sold in the market, how many eggs were left?



2.) A farm has 800 different and trees. If $\frac{1}{4}$ of it are coconut trees, $\frac{1}{2}$ are mango trees, and the rest are orange trees, how many orange trees are there?

3.) Mario has 420 workers in his farm, $\frac{3}{4}$ are men and the rest are women. The workers will be divided into 4 groups to do plowing, planting, watering the plants and feeding the animals. How many workers will be working together in each task if all the women will be watering the plants.

4.) Jona's family owns a farmland. 60% of the farm is planted with sugarcane and the rest is planted with papaya trees. If there are 540 sugarcane, how many papaya trees are there?



CROPS AT THE MARKET

The prices of the crops in the market are increasing day by day. Help me find the cheapest but good quality ones by reading and answering the following problems. Show your solution on the space provided.

1.) Find the cost of 60 pears at $\$4.5/3$ pieces pears.



2.) Find the cost of 48 kilograms of chicken meat at $\$12.8/2$ kilograms.

3.) Find the cost of 120 trays of eggs at $\$21.3/3$ trays of eggs.



4.) Find the cost of 80 coconut fruits at $\$4.6/2$ coconut fruits.

5.) What is the cost of $3 \frac{1}{4}$ kilograms of carrots at $\$2/ \frac{1}{4}$ kilograms.



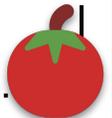
Blank dashed box for solution to problem 1.

Blank dashed box for solution to problem 2.

Blank dashed box for solution to problem 3.

Blank dashed box for solution to problem 4.

Blank dashed box for solution to problem 5.



CAMPFIRE AT THE FARM

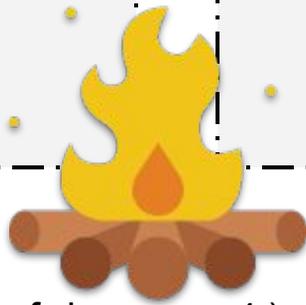
Today is a perfect day to have campfire at the farm. To set up the campfire, read the following problems carefully. Answer what is asked and show your solution on the space provided.

1.) Diane harvested 320 watermelons from her farm. 80% of it were sold in the market for \$2.25/piece. How much did she earn?

Solution:

2.) Anna spent 60% of her monthly earnings from the farm to pay for her expenses with a total amount of \$600. How much is her monthly earnings?

Solution:



3.) Bea bought 5 boxes of rice cakes for her 20 farm workers. How many workers will share for every 1 box of rice cakes?

Solution:

4.) There 120 workers in a farm. If 35% are women and the rest are men, how many men workers are there?

Solution:



SELL YOUR HARVEST

Selling your harvest in the market will help you earn more. To sell the crops your harvested crops, read and answer the following problems carefully. Show your solution on the space provided.

1.) Andrew bought $9\frac{9}{10}$ kilograms of cucumber and he paid \$36.4. How much each kilogram of cucumber costs?



2.) Bel is selling tomatoes in the market. If a kilogram of tomatoes costs \$3.8, how much is $\frac{2}{8}$ kilogram of tomatoes?



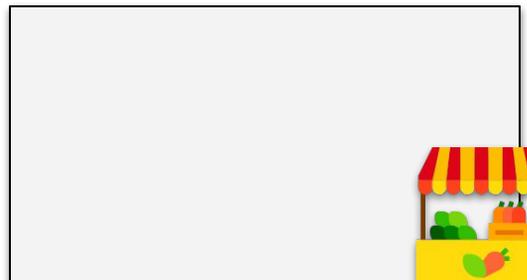
3.) Hazel wants to buy grapes in the market. If she has \$30.6 and each kilogram of grapes costs \$10.2, how many kilograms can she buy?



4.) It costs \$34 to buy 4 kilograms of carrots. How much each kilograms of carrots costs?



5.) The costs of banana and apple in the market are \$5.8/kg and \$6.4/kg, respectively. If you plan to buy $\frac{1}{4}$ kg banana and $\frac{1}{2}$ kg apple, how much money you should bring?



ANIMALS FEEDING

The farmer needs help in feeding the animals in his farm. Help him by reading and answering the following problems carefully. Show your solution on the space provided.

1.) Trixie harvested 15 bananas in her farm. If 5 of the bananas will be used to make banana cue, what percent the harvested banana will be left?

2.) You planted a total of 20 trees in your farm. 40% of the trees are lemon trees and the rest are eggplant trees. How many eggplant trees did you plant?

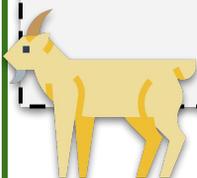


3.) You manages a 3-hectare farm with lots of plants and animals. 55% of this land were planted with variety of vegetables and the rest of the land is where the animals are located. How many hectares of land are for the animals?



4.) There are 140 animals in the farm. 30 of it are horses, 60 are goats, 15 are carabaos and the rest are pigs. What percent are goats? What percent are pigs?

5.) Your family owns an avocado farm that bears 150 crates of avocado. If 10% of the crates were rotten, how many crates can you still sell in the market?



ANSWER GUIDE

Activity 1

- | | |
|----------|----------|
| 1. False | 4.) True |
| 2. True | 5.) True |
| 3. False | |

Activity 2

1.) $600 \times \frac{1}{4} = 150$ sacks

2.) $6 \text{ kg} - 4.2 \text{ kg} = 1.8 \text{ kg}$

3.) $\frac{1}{2} + \frac{2}{3} = \frac{7}{6} \text{ kg}$

4.) $12 \times \frac{1}{4} = 3$ horses

$3 + 18 = 21$ animals

5.) $800 \times \frac{3}{5} = 480$

$600 - 480 = 120$ chickens

Activity 3

1.) $50 \times 2 \frac{1}{2} = 125$ papaya trees

2.) $560 \times \frac{7}{10} = 392$ kilograms

$420 \times \$1.5 = \630

3.) $30 \times \frac{1}{10} = 3$ tomato trees

4.) $\frac{9}{2} \text{ hrs} = 4.5 \text{ hrs} = 270 \text{ mins.}$

$\frac{270}{30} = 9$; $9 \times 20 = 180$
eggplant trees

5.) $300 \times \frac{3}{4} = 225$ hens

$225 \times 6 = 1350$ eggs

$300 \times \frac{1}{4} = 75$ hens

$75 \times 4 = 300$ eggs

Total eggs = $1350 + 300$

1650 eggs can be harvested



ANSWER GUIDE

Activity 4

$$1.) 1 - \frac{1}{2} - \frac{1}{4} = \frac{1}{4}$$

$$360 \times \frac{1}{4} = 90 \text{ cows}$$

$$360 \times \frac{1}{2} = 180 \text{ carabaos}$$

There are 180 carabaos, 90 goats and 90 cows in Gino's farm.

$$2.) 50 \frac{1}{4} = 50.25 \text{ sacks}$$

$$65 \frac{1}{2} = 65.50 \text{ sacks}$$

$$83 \frac{3}{4} = 83.75 \text{ sacks}$$

$$\begin{aligned} \text{Total sacks} &= 50.25 + 65.50 + 83.75 \\ &= 199.5 \text{ or } 199 \frac{1}{2} \text{ sacks} \end{aligned}$$

$$3.) 160 \times \frac{3}{10} = 48 \text{ coconut trees}$$

$$48 \times 10 = 480 \text{ coconut fruits}$$

$$160 \times \frac{7}{10} = 112 \text{ coconut trees}$$

$$112 \times 8 = 896 \text{ coconut fruits}$$

$$\text{Total : } 480 + 896 = 1376 \text{ coconut fruits}$$

$$4.) 7 \frac{5}{9} = 7.56 \text{ meters}$$

$$4 \frac{4}{7} = 4.57 \text{ meters}$$

$$7.56 \text{ meters} - 4.57 \text{ meters} = 2.99 \text{ meter}$$

Activity 5

$$1.) 16 \times \frac{1}{4} = 4 \text{ boxes}$$

$$4 \times 45 = 180 \text{ oranges}$$

$$16 \times \frac{3}{4} = 12 \text{ boxes}$$

$$12 \times 30 = 360 \text{ oranges}$$

$$\text{Total: } 180 + 360 = 540 \text{ oranges}$$

$$2.) 12/2 = 6 ; 6 \times 30 \text{ mins} = 180 \text{ mins}$$

$$180 \text{ mins} \times \frac{1 \text{ hour}}{60 \text{ mins}} = 3 \text{ hours}$$

$$3.) 8/1 = 8 ; 8 \times \frac{1}{4} = 2 \text{ kilograms}$$

$$4.) 1 - \frac{3}{4} = \frac{1}{4} ; \$1200 \times \frac{1}{4} = \$300$$

$$5.) 8 \times \frac{7}{12} = 4.67 \text{ hectares}$$

Activity 6

$$1.) 1 - \frac{3}{10} = \frac{7}{10} ; 320 \times \frac{7}{10} = 224 \text{ eggs}$$

$$2.) 1 - \frac{1}{4} - \frac{1}{2} = \frac{1}{4} ; 800 \times \frac{1}{4} = 200 \text{ orange trees}$$

$$3.) 420 \times \frac{1}{4} = 105 \text{ women}$$

$$420 - 105 = 315 \text{ men}$$

$$315/3 = 105 \text{ workers}$$

$$4.) \text{Let } x \text{ be sugarcane and papaya}$$

$$x(0.6) = 560 ; x = 560/0.6$$

$$x = 900 \text{ sugarcane and papaya}$$

$$900(0.4) = 360 \text{ papaya trees}$$



ANSWER GUIDE

Activity 7

- 1.) $60/3 = 20$; $20 \times \$4.5 = \90 3.) $120/3 = 40$; $40 \times \$21.3 = \852
2.) $48/2 = 24$; $24 \times \$12.8 = \307.2 4.) $80/2 = 40$; $40 \times \$4.6 = \184
5.) $3 \frac{1}{4} = 3.25$; $3.25 / \frac{1}{4} = 13$
 $13 \times \$2 = \26

Activity 8

- 1.) $320 \times 0.8 = 256$; $256 \times \$2.25 = \576 3.) $20/5 = 4$ workers will share
in 1 box
2.) Let $x =$ Anna's monthly earning
 $(0.6)(x) = \$600$ 4.) $120 \times 0.35 = 42$ women workers
 $x = \$600/0.6 = \1000 $120 - 42 = 78$ men workers

Activity 9

- 1.) $9 \frac{9}{10} = 9.9$; $\$36.4/9.9 = \3.68 4.) $\$34/4 = \$8.5/\text{kg}$
2.) $\$3.8/4 = \0.95
3.) $\$30.6/\$10.2 = 3$ kilograms 5.) banana: $\$5.8/4 = \1.45
apple: $\$6.4/2 = \3.2
Total amount: $\$1.45 + \$3.2 = \$4.65$

Activity 10

- 1.) $15 - 5 = 10$ 4.) $\frac{60}{140} \times 100\% = 42.86\%$ are goats
 $\frac{10}{15} \times 100\% = 66.67\%$ $\frac{35}{140} \times 100\% = 25\%$ are pigs
2.) $100\% - 40\% = 60\%$ 5.) $150 \times 0.10 = 15$
 $20 \times 0.6 = 12$ eggplant trees $150 - 15 = 135$ crates
3.) $100\% - 55\% = 45\%$
 $3 \times 0.45 = 1.35$ hectare



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