# 13   Fractions

Ramulamma is getting old. She has four pieces of land, each having the same area. She keeps one piece to herself and divides the remaining 3 pieces equally between her 2 children. How many pieces of land will each child get?

Think : How many full pieces of land will each child get? How many half pieces of land will each child get?

Ramulamma divided her land like this-

She gave one piece of land to each of her children. She then divided the third piece into two equal halves and gave one each to her children.
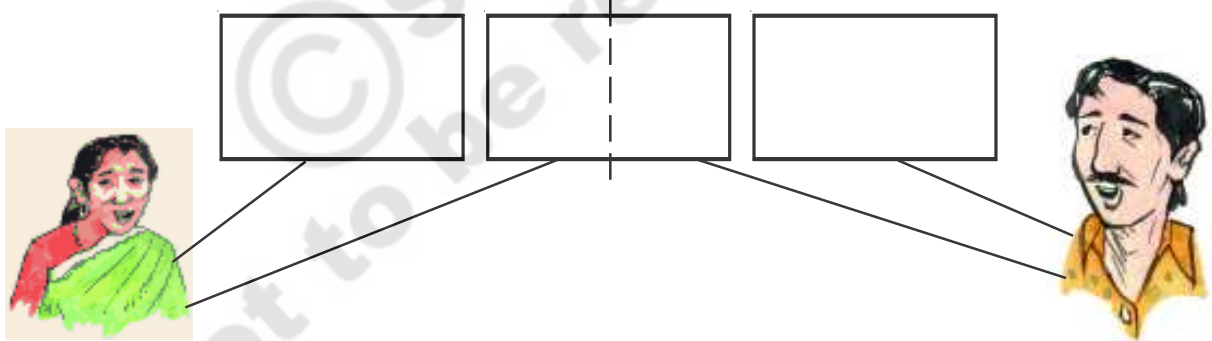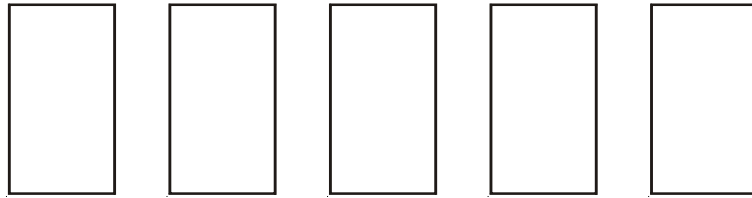

So, each child got one and a half pieces of land.

$3 \div 2$ is the same as $\dfrac{3}{2}$

This is written as $\dfrac{3}{2} = 1 + \dfrac{1}{2}$ or $1\dfrac{1}{2}$ pieces of land.

So when 3 pieces of land are divided equally between 2 people, each person gets $1 + \dfrac{1}{2}$ or $1\dfrac{1}{2}$ piece of land.
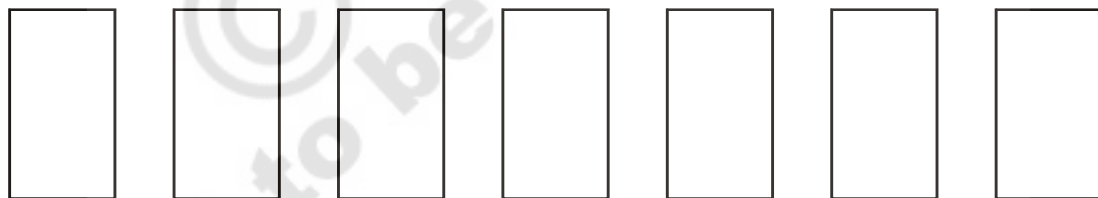
If Ramulamma had 5 pieces of land each having same area to divide between her 2 children equally then how many pieces of land would each child get?

So when 5 pieces of land are divided equally between 2 people, each person get _____ or _____ pieces of land.

$\frac{5}{2}$ = _____ + _____ pieces of land.

What about if Ramulamma had 7 pieces of land to divide between her 2 children?

So when 7 pieces of land are divided equally between 2 people, each person get _____ or _____ pieces of land.

$\frac{7}{2}$ = _____ + _____ pieces of land.

Fractions

Valya also wants to divide his 5 pieces of land equally among his 4 children. How will Valya divide his land equally among his 4 children?
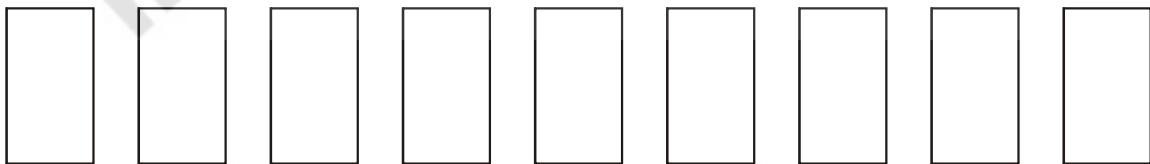
(a) How many full pieces of land will each child get?

(b) How many one-fourth pieces of land will each child get?
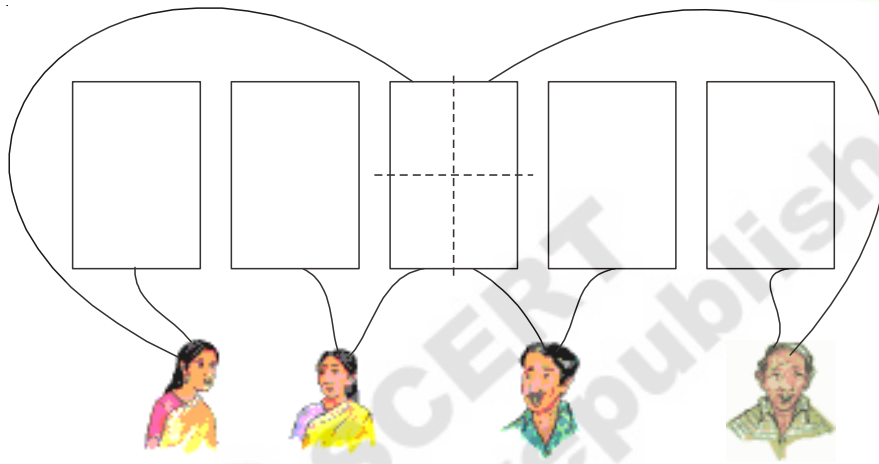
When 5 pieces of land are divided equally among 4 people each person gets one full piece of land and one-fourth pieces of land.

$$\frac{5}{4} = 1 + \frac{1}{4} \text{ or } 1\frac{1}{4} \text{ pieces of land.}$$

(c) What if Valya had to divide 9 pieces of land among his 4 children, how many pieces of land will each child get?

When 9 pieces of land are divided equally among 4 people each person will get _____ pieces of land.

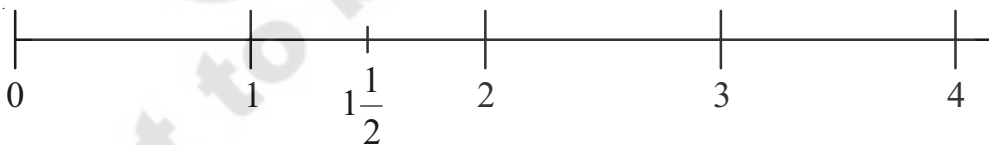$$\frac{9}{4} = \text{\_\_\_\_\_} + \text{\_\_\_\_\_} \text{ or } \text{\_\_\_\_\_} \text{ pieces of land.}$$

Can we show $1\dfrac{1}{2}$ on the number line.

Yes, it will lie between 1 and 2 because it is more than 1 and less than 2.

$1\dfrac{1}{2}$ is $\dfrac{1}{2}$ more than 1. If we divide the space between 1 and 2 into 2 equal parts, then one part will be equal to $\dfrac{1}{2}$. So $1\dfrac{1}{2}$ will lie right in the middle of 1 and 2.

Now can you show $\dfrac{1}{2}$, $2\dfrac{1}{2}$ and $3\dfrac{1}{2}$ on the number line.

$$0 \qquad 1 \qquad 1\dfrac{1}{2} \qquad 2 \qquad 3 \qquad 4$$

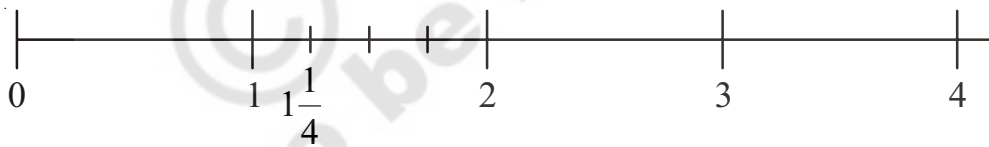Remember $\dfrac{1}{2}$ is more than 0 but less than one.

Also, remember that $2\dfrac{1}{2} = 2 + \dfrac{1}{2}$ and $3\dfrac{1}{2} = 3 + \dfrac{1}{2}$

Fractions

Now let us show $1\frac{1}{4}$ on the number line.

$1\frac{1}{4}$ will lie between 1 and 2 because it is more than 1 and less than 2.

$1\frac{1}{4}$ is $\frac{1}{4}$ more than 1. If we divide the space between 1 and 2 into 4 equal parts, then one part will be equal to $\frac{1}{4}$.

```
 |—————————————|——|—|—|——|—————————|—————————|
 0             1 1¼        2         3         4
```

Now can you show $\frac{1}{4}$, $\frac{9}{4}$ and $\frac{13}{4}$ on the number line drawn above.

Remember $\frac{1}{4}$ is more than 0 but less than 1.

Also remember that $\frac{9}{4} = 2 + \frac{1}{4}$ and $\frac{13}{4} = 3 + \frac{1}{4}$.

The grocery bill

The prices of various commodities are displayed in the grocer's shop

Item	Price
Rice	₹ 30 per kg
Wheat	₹ 20 per kg
Mustard oil	₹ 120 per liter
Turmeric	₹ 160 per kg
Salt	₹ 15 per kg
Dal	₹ 60 per kg
Sugar	₹ 32 per kg

(a)   Kaumudhi purchases the following things. How much money will she have to pay for each? How much will her grocery bill be?

(i)   2 kg rice _____   (iv) $2 + \dfrac{1}{2}$ kg wheat _____

(ii) $\dfrac{1}{4}$ kg of Turmeric _____   (v) $\dfrac{1}{2}$ litre mustard oil _____

(iii) $\dfrac{1}{2}$ kg dal _____   (vi) $1 + \dfrac{1}{2}$ kg sugar _____

(b)   If Kaumudhi buys $\dfrac{1}{2}$ kg of tea powder for ₹ 90, how much would 1 kg tea powder cost?

(c)   If Kaumudhi buys $\dfrac{1}{4}$ kg of chilli powder for ₹ 40, how much would 1 kg chilli powder cost? _____

How much cloth did Renu use?

Renu is stitching a frock for her daughter and a shirt for her son. She purchases 1 meter of mangalgiri cotton cloth and 1 meter of pochampally cotton cloth. She

uses $\dfrac{3}{4}$ part of mangalgiri cotton cloth to make the frock and $\dfrac{1}{2}$ part of pochampally cotton cloth to make the shirt.

(a)   How many centimeters of mangalgiri cotton cloth does Ranu use? How much is left? _____

(b)   How many centimeters of pochampalli cotton cloth does Ranu use? How much is left? __

1 meter = 100 cm
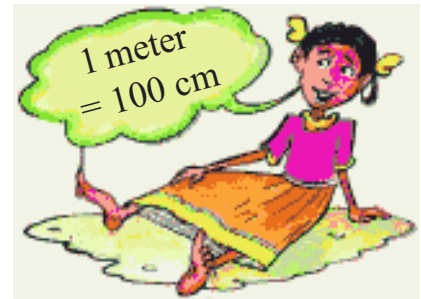
Balance the pans

Which of these weights will balance the pans given below?

1 kg = 1000 gm

$\dfrac{1}{2}$ kg

$\dfrac{1}{4}$ kg

$\dfrac{3}{4}$ kg

How much cooking oil is there in Manju's house?

1 liter = 1000 ml

$\dfrac{1}{4}$ liter $\dfrac{1}{2}$ liter $\dfrac{3}{4}$ liter

(a)   How many liters of cooking oil does Manju have in her kitchen? _____

Now let us divide rotis

If one roti is divided among 3 people equally then how much will each person get?
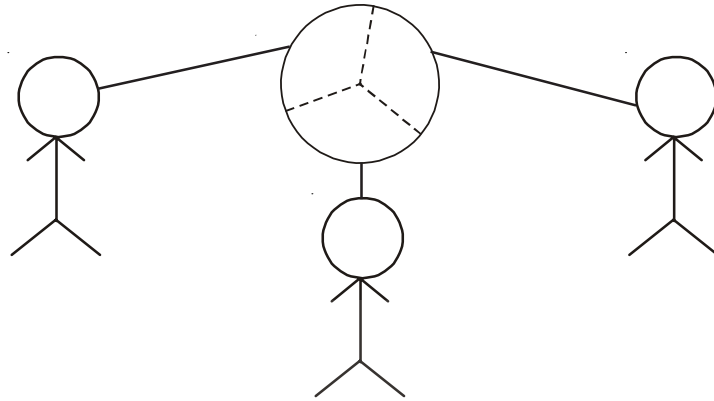
Each child will get one part out of three parts or one-third of the roti or $\frac{1}{3}$ roti.

Similarly, if one roti is divided equally among 5 people then each person will get

one part out of 5 parts or one fifth of the roti or $\frac{1}{5}$ roti.

Do This

1. If one roti is divided among 6 people equally then how much will each person get? Write in words and as a number.

2. If one roti is divided among 8 people eqaully then how much will each person get? Write in words and as a number.

3. If one roti is divided among 10 people equally then how much will each person get? Write in words and as a number.

Fractions

Now, divide 7 rotis among 3 people equally. How many rotis will each one get?
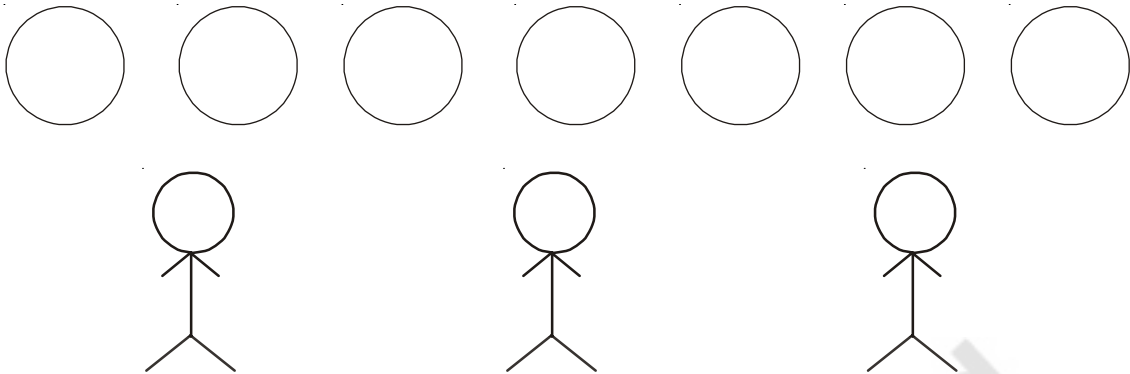
(a) How many full roties?

(b) How many one-third roties?

Do This

1. What do you get when you divide 11 by 5?

2. What do you get when you divide 13 by 6?

3. What do you get when you divide 9 by 8?

4. What do you get when you divide 12 by 5?

Now let us mark these numbers on the number line.
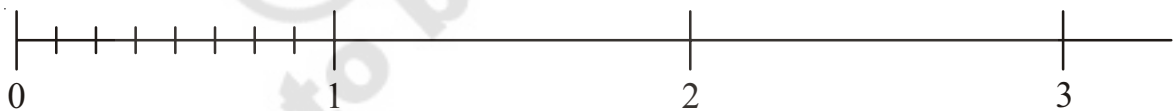
Mark $\dfrac{1}{3}$ on this number line.

```
|——+——+——+——————————————+——————————————+————
0           1              2              3
```
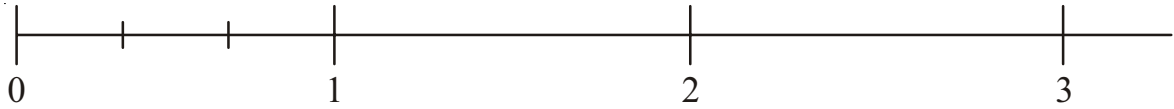
Mark $\dfrac{1}{5}$ on this number line.

```
|—+—+—+—+——+——————————————+——————————————+—
0           1              2              4
```
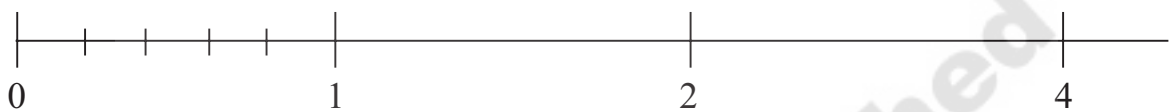
Mark $\dfrac{1}{6}$ on this number line.

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|+—+—+—+—+—+——————————————+——————————————+—
0           1              2              3
```

Mark $\dfrac{1}{8}$ on this number line.

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|+—+—+—+—+—+—+—+——————————+——————————————+—
0           1              2              3
```

Mark $\dfrac{1}{10}$ on this number line.

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|+++++++++|——————————————+——————————————+—
0           1              2              3
```
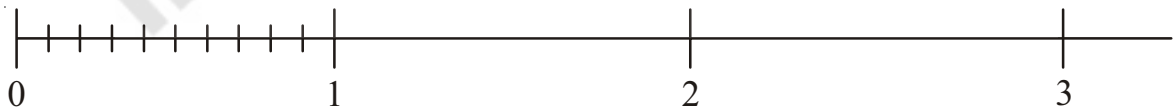
Do This

Which is greater?

(a) $\dfrac{1}{10}$ or $\dfrac{1}{5}$

(b) $\dfrac{1}{5}$ or $\dfrac{1}{6}$

(c) $\dfrac{1}{4}$ or $\dfrac{1}{8}$

$\frac{1}{2}, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, 1\frac{1}{2}, 2\frac{1}{2}, 1\frac{1}{4}, \frac{5}{2}, \frac{9}{4}, \frac{1}{8}, \frac{1}{10}$ etc are all numbers and can be shown on the number line. They are called fractional numbers or fractions. They are used when an object or a group of objects is divided into equal parts. The number below the line is called the denominator and tells us the number of parts in which the object or group of objects is being divided into. The number above the line is called the numerator and tells us the number of parts that we are taking out.

Try This

1. Write the coloured portions as fractions. Which fraction is the greatest? Which fraction is the smallest?

(a) _____

(b) _____

(c) _____

(d) _____

(e) _____

(f) _____
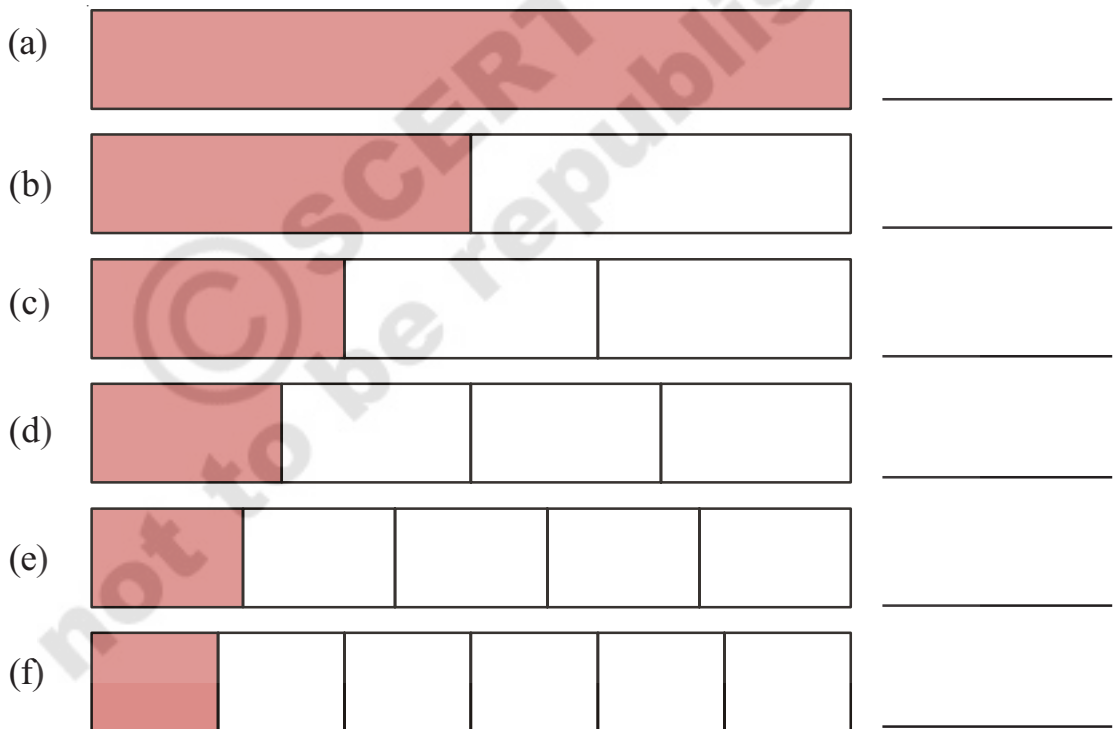
2. Which is greater?

(a) $2\frac{1}{3}$ or $2\frac{1}{5}$

(b) $4\frac{1}{8}$ or $4\frac{1}{4}$

(c) $6\frac{1}{7}$ or $6\frac{1}{9}$

(e) $10\frac{1}{2}$ or $10\frac{1}{4}$

(e) $10\frac{1}{2}$ or $11\frac{1}{2}$

Play with Rubik's cube

1.
(a) Experess the blue coloured part as a fraction?

(b) Experess the green coloured part as a fraction?

(c) Experess the red coloured part as a fraction?

(d) Experess the yellow coloured part as a fraction?

(e) Which fraction is the greatest? Which fraction is smallest?

What part of the medicine tablet strip is remaining?

(a) Rama took 3 tablets on the first day of her fever. What part of the tablets did she take? What part of tablets was left? _____

(b) She took 2 more tablets the next day. Now, what part of the tablets is left? _____

(c) She took one more the third day. Now what part of the tablets is left? _____

(d) Which part of the medicine tablets in the strip is more- the one that is remaining or the part that was taken? _____
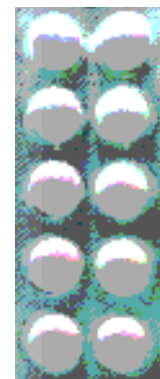
Flower beds

Mangalam grows flowers on his land. He has divided his land into 9 equal parts.

(a) Which colour flower grows on the biggest part of the land? What part of the total land is this? _____

(b) What part of the land are the white and orange flowers grown on? Is this part bigger than the part on which the red colour flowers are grown? _____

Who ploughed more?

Somla, Mangya and Valya have fields of equal area.

All have divided their fields into six equal parts but have cultivated unequal parts.

The cultivated parts are shaded in the pictures below.
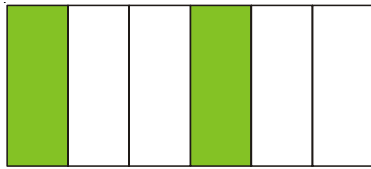
Somla's field
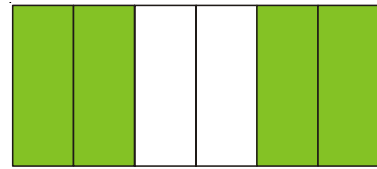

Mangya's field
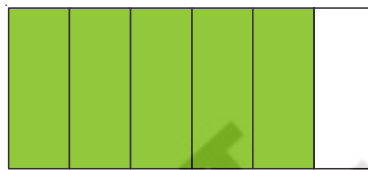
Valya's field

(a)   What part of his field has Somla cultivated?

(b)   What part of his field has Mangya cultivated?

(c)   What part of his field has Valya cultivated?

(d)   Who has cultivated the largest part of his field?

(e)   Who has cultivated the smallest part of his field?

Do This

Express the coloured part of circles given below as fractions. Which fraction is greatest? Which fraction is smallest?
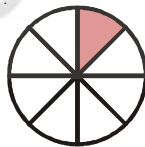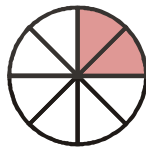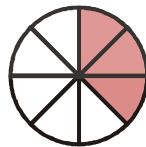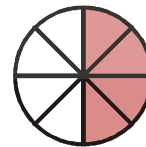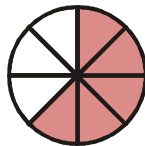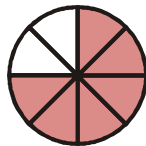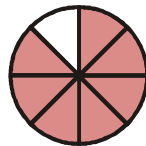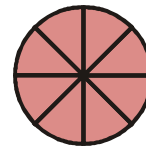
Greatest fraction _____   Smallest Fraction _____

From 7 am to 7 pm

Kaushik wakes up at 7 o'clock in the morning. The watch given below tells us what he does till 7 o'clock in the evening.
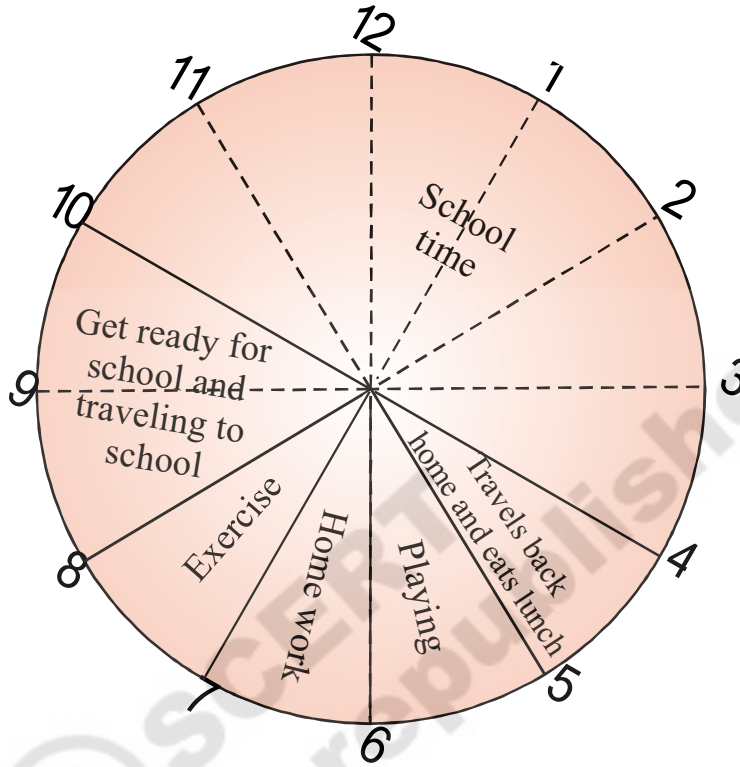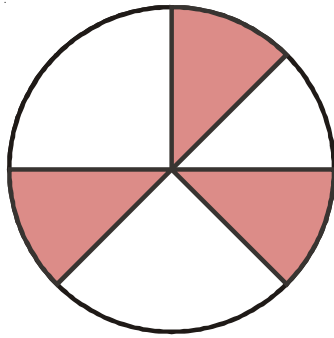

(a) What part of 12 hours does Kaushik spend on exercise?

(b) What part of 12 hours does Kaushik spend in school?

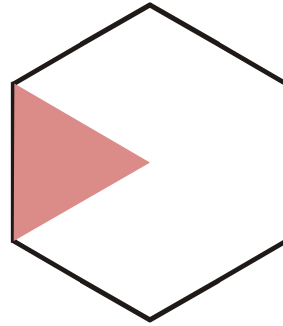(c) What part of 12 hours does Kaushik spend on playing and doing homework?

Do This

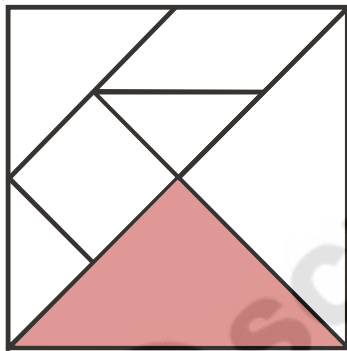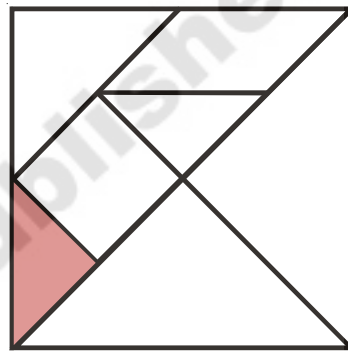1. What part of these figures is coloured?

(a)

(b)
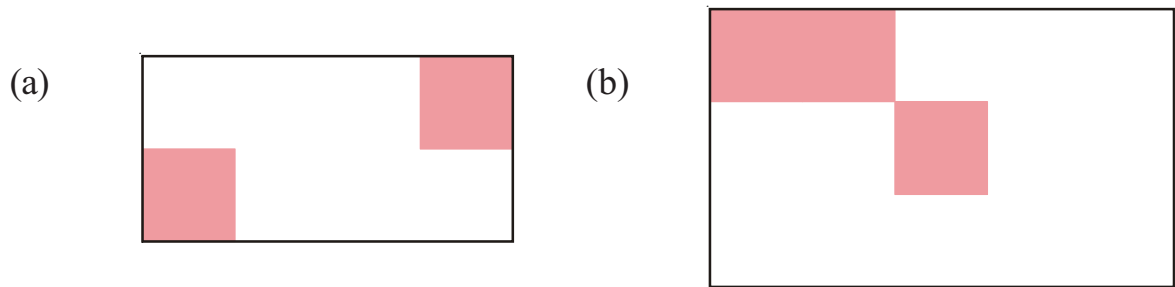
(c)

(d)

2. What part of these tangram is coloured?

(a)

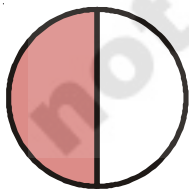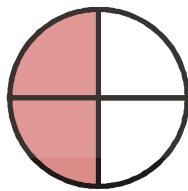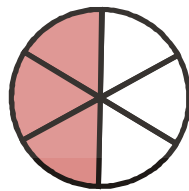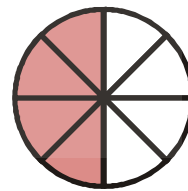(b)

Part that look alike

What part is shaded?

_____ _____ _____ _____

Looking at the above pictures can you say that $\dfrac{1}{2}=\dfrac{2}{4}=\dfrac{3}{6}=\dfrac{4}{8}$?

Activity

Take a piece of paper. Fold it into two equal halves. Now colour one half.

Now fold this half into half again. Open the piece of paper. How many total parts is the paper divided in now? What part of the paper is shaded now?
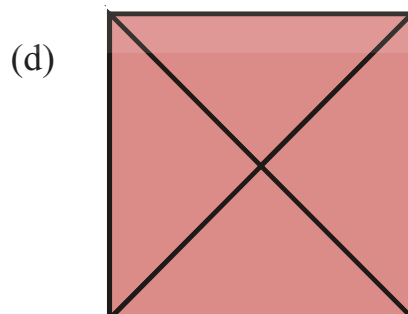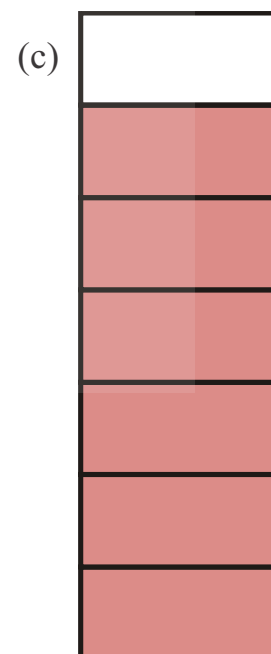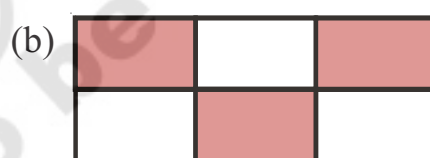
Can we say that $\dfrac{1}{2} = \dfrac{2}{4}$

Try folding the paper into 6 parts now. How many total parts is the paper divided in now? What part of the paper is shaded now?
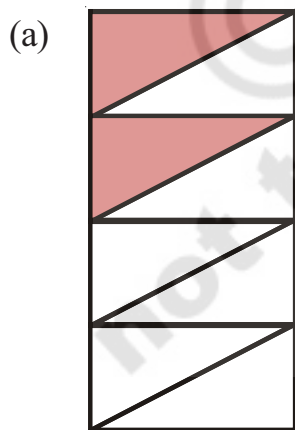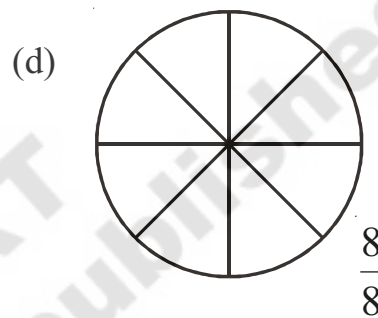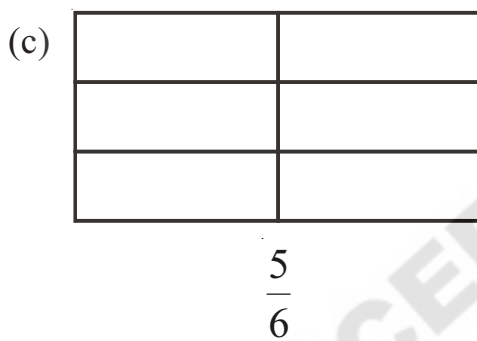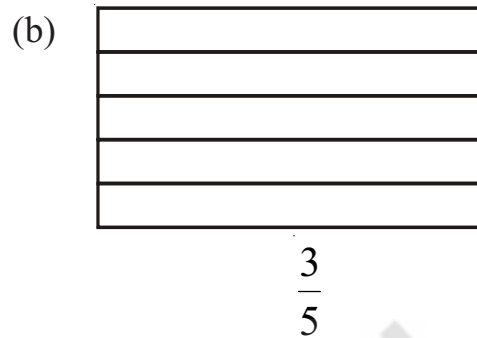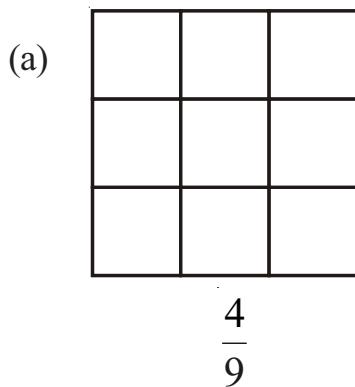
What about when you fold the paper into 8 parts?

Exercise

1. The figures given below have been divided into equal parts. What part each figure has been shaded?

(a)

(b)

(c)

(d)

2. Colour that part of the figure that has been written below it.

(a)

$$\frac{4}{9}$$

(b)

$$\frac{3}{5}$$

(c)

$$\frac{5}{6}$$

(d)

$$\frac{8}{8}$$

3. Govind bought 12 kg potatoes. $\frac{2}{3}$ of the potatoes were big and $\frac{1}{3}$ of them were small. How many kgs of potatoes were big?

4. Usman cycles $\frac{7}{10}$ of the distance from home to school. The rest of the distance he walks. What part of the distance does he walk?

5. One day has 24 hours. If Ravi sleeps for $\frac{1}{3}$ part of hours, studies and works for $\frac{1}{2}$ part of hours and plays for $\frac{1}{6}$ part of hours in the day, then how many hours does he spend in each of these activities?

6. Earrings weigh 32 grams. If $\frac{7}{8}$ part of the weight is silver, then how many grams of silver is there in the earrings?

7. A class has 32 students. $\frac{3}{4}$ part of them are boys. How many boys are there in the class?

8. Radha read $\frac{1}{6}$ part of her book in the morning and $\frac{3}{6}$ part in the evening. How much has she read? Write as a fractional number.

9. John gave his friends $\frac{2}{5}$ part of the cake. How much was left with him?

10. When Abdulla climbed up three fourth of the tree, how much was left to climb?

11. John bought 12 apples from the market. He and his family ate $\frac{5}{12}$ part of the apples and $\frac{3}{12}$ part of apples got spoilt. How many apples are left? Write as fractional number.

12. Mohan got $\frac{2}{5}$ of a chocolate and Renuka got $\frac{3}{5}$ part. Who got more chocolate?

13. Hari spent $\frac{3}{4}$ part of his pocket money on Sunday and $\frac{1}{4}$ part of his pocket money on Monday. On which day did he spend more?

14. Ashish finished $\frac{7}{12}$ part of his home work on Saturday and $\frac{3}{12}$ part on Sunday.
    (a) What part of the home work did Ashish finish in the two days?
    (b) What part of the home work is still left?

15. There were 15 flowers in a rosebush. Vani picked $\frac{1}{5}$ part of them for decorating her room. How many flowers did she pick?

16. Ramu bought $\frac{3}{4}$ kg of apples from the market. He gave $\frac{1}{4}$ kg to his brother. What part of the apples is left with him?