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PRIMARY MATHEMATICS
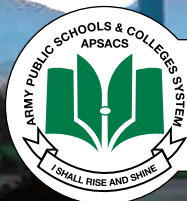
STUDENTS' COURSE BOOK

5

ADDENDUM

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ARMY PUBLIC SCHOOLS & COLLEGES SYSTEM

Contents

ADD AND SUBTRACT UPTO 6-DIGIT NUMBERS

1. Add

   (a)   732443 + 388   =

   (b)   157946 + 2583   =

   (c)   700490 + 99607   =

   (d)   866563 + 494928 =

2. Subtract

   (a)   998860 – 475   =

   (b)   205833 – 9641   =

   (c)   344793 – 82064   =

   (d)   651085 – 573218 =

3. Estimate and check.

   (a)   386563 + 82949

   (b)   105721 + 672351

   (c)   823307 – 664255

   (d)   579994 – 109533

Can you estimate in more than one way to check the reasonableness of your answers?

1

SOLVING WORD PROBLEMS

1. A baker made 12750 chocolate cookies and 11638 vanilla cookies.
   He sold 13195 cookies altogether.
   (a) How many cookies did the baker make altogether?
   (b) How many cookies did the baker have left?

2. Factory A produces 506384 toys.
   Factory B produces 503912 toys.
   What is the difference between the number of toys Factory A and Factory B produce?

3. A shop sold an oven for Rs 35118 and a wall clock for Rs 1999.
   How much did the two items cost altogether?

4. Mrs Lim earned Rs 734600 in march and Rs 625300 in april.
   What was the sum of money she earned in march and april?

2. There were 60000 books for sale at a book fair.
   34190 books were sold on the first day and 22680 books were sold on the second day.
   How many books were there left at the end of the second day?

5. There were 10589 participants in a contest in 2019.
   In 2018, there were 2079 more participants in the contest than in 2019.
   What was the total number of participants in the two years?

6. On Saturday, 30718 people attended a funfair.
   8650 more people attended the funfair on Saturday than on Sunday.
   How many people attended the funfair on the two days altogether?

DIVISIBILITY RULES FOR 7 AND 11

Divisible means a number can be divided evenly with another number with no remainders.

Divisibility rule for 7 and 11 are as follows:

A number is divisible by

| 7 | If the difference between twice the unit digit of a number and the remaining part of that number is divisible by 7. |
| 11 | If the difference between the sum of digits at the add places and the sum of digit at the even places is divisible by 11. |

PRACTICE

1. Check whether the following numbers are divisible by 7 or 11.
   (a) 364   (b) 80762   (c) 24878
   (d) 1375   (e) 3668

PRIME AND COMPOSITE NUMBERS

IN FOCUS

Look at the lists given below.

List A			List B	

List A

Number	Factors
2	1, 2
3	1, 3
5	1, 5
7	1, 7
11	1, 11

List B

Number	Factors
4	1, 2, 4
6	1, 2, 3, 6
8	1, 2, 4, 8
9	1, 3, 9
10	1, 2, 5, 10

What do you notice about the factors of the numbers in the two lists?

LET'S LEARN

1.
List A

Number	Factors
2	1, 2
3	1, 3
5	1, 5
7	1, 7
11	1, 11

The numbers have exactly two distinct factors.

In list A, the numbers 2, 3, 5, 7 and 11 can be divided exactly by 1 and itself.
These numbers are called **prime numbers**.

2.

List B

Number	Factors
4	1, 2, 4
6	1, 2, 3, 6
8	1, 2, 4, 8
9	1, 3, 9
10	1, 2, 5, 10

1 is neither a prime nor composite number.

In list B, the numbers 4, 6, 8, 9 and 10 have more than two different factors.

Such numbers are called **composite numbers**.

3. The table below shows all the prime numbers between 1 and 20 in red.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

The factors of 18 are 1, 2, 3, 6, 9. 18 cannot be a prime number.

The factors of 19 are 1 and 19. 19 is a prime number.

4. List the prime numbers between 21 and 50.

The prime numbers are ⬜ , ⬜ , ⬜ , ⬜ , ⬜ , ⬜ and ⬜ .

PRACTICE

1. Circle all the prime numbers.

51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

COMPARING AND ORDERING FRACTIONS

IN FOCUS

Nora has $1\frac{2}{3}$ of a cake.

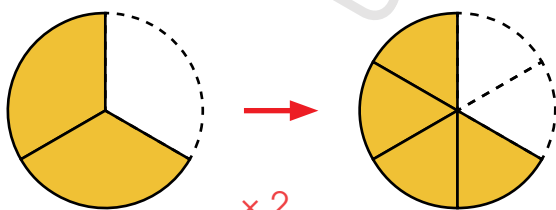Saif has $1\frac{1}{6}$ of a similar cake.

Who has less cake?

LET'S LEARN

1. Which is smaller, $1\frac{2}{3}$ or $1\frac{1}{6}$?

Since the whole numbers are the same, we compare the fractions.

$$\frac{2}{3} \overset{\times 2}{\underset{\times 2}{=}} \frac{4}{6}$$

$$\frac{1}{6}$$

$1 \quad 1\frac{1}{6} \quad 1\frac{2}{6} \quad 1\frac{3}{6} \quad 1\frac{4}{6} \quad 2$

$1\frac{2}{3}$
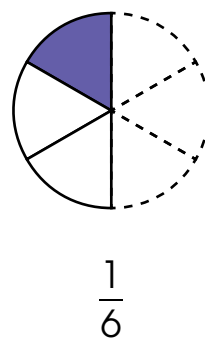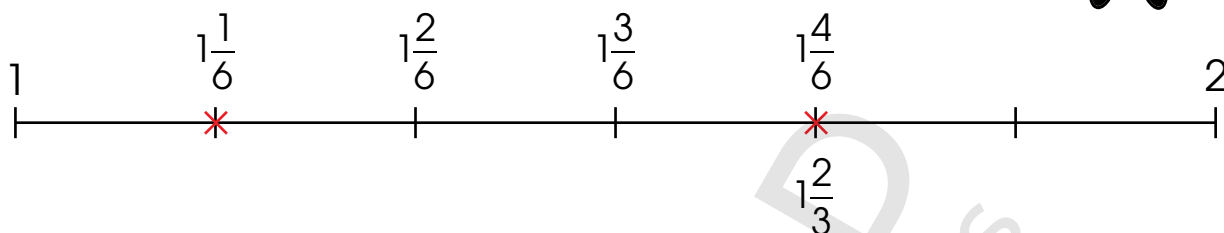
$1\frac{1}{6} < 1\frac{2}{3}.$

2. Which is greater, $1\frac{5}{8}$ or $1\frac{3}{4}$?

We can use equivalent fractions to compare $1\frac{5}{8}$ and $1\frac{3}{4}$.

$\frac{5}{8}$

$\frac{3}{4} \overset{\times 2}{\underset{\times 2}{=}} \frac{6}{8}$

$1 \quad 1\frac{1}{8} \quad 1\frac{2}{8} \quad 1\frac{3}{8} \quad 1\frac{4}{8} \quad 1\frac{5}{8} \quad 1\frac{6}{8} \quad 1\frac{7}{8} \quad 2$

$1\frac{5}{8} \qquad 1\frac{3}{4}$
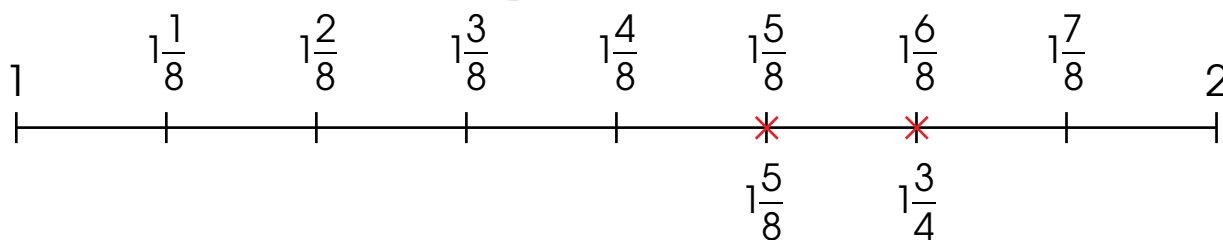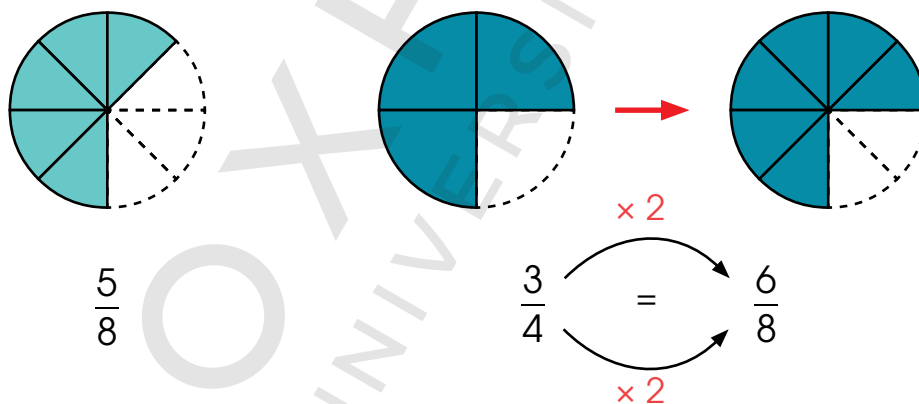
$1\frac{3}{4} > 1\frac{5}{8}.$

4. Which is greater, $\dfrac{13}{5}$ or $2\dfrac{7}{10}$?
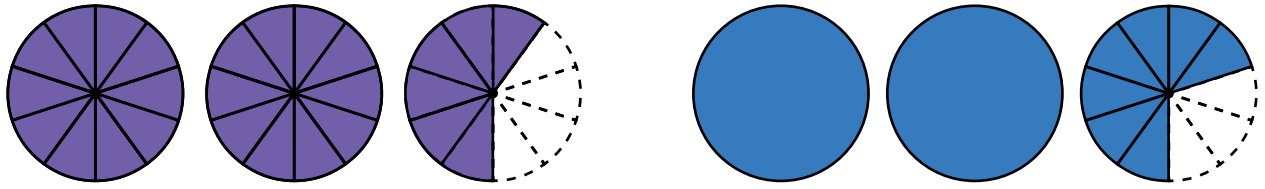
$$\dfrac{13}{5} \xrightarrow{\times 2} = \dfrac{26}{10} \xleftarrow{\times 2}$$

$2\dfrac{7}{10}$

We can compare by converting the mixed number into an improper fraction.

$$2\dfrac{7}{10} = \dfrac{27}{10}$$

$\dfrac{27}{10} > \dfrac{26}{10}$.

So, $2\dfrac{7}{10} > \dfrac{13}{5}$.

We can also compare by converting the improper fraction into a mixed number.

$$\dfrac{13}{5} = \dfrac{26}{10} = 2\dfrac{6}{10}$$

$\dfrac{7}{10} > \dfrac{6}{10}$.

So, $2\dfrac{7}{10} > \dfrac{13}{5}$.

5. Arrange $\dfrac{9}{5}$, $1\dfrac{1}{10}$ and $1\dfrac{3}{10}$ in increasing order.

Use or a number line to compare.

$1\frac{1}{10}$ is smaller than $1\frac{3}{10}$.

Compare $1\frac{3}{10}$ and $\frac{9}{5}$.

$$\frac{9}{5} = 1\frac{4}{5} = 1\frac{8}{10}$$
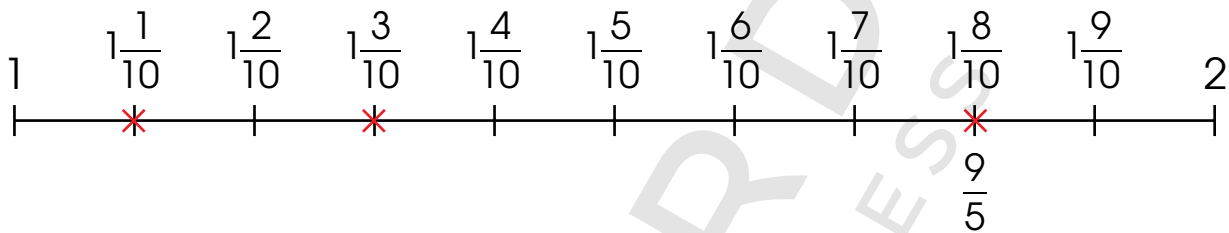
$1\frac{1}{10}$ is the smallest.

$\frac{9}{5}$ is the greatest.

Arranging the fractions in increasing order, we have

$$1\frac{1}{10}, \ 1\frac{3}{10}, \ \frac{9}{5}$$

6. Arrange $\frac{19}{6}$, $2\frac{11}{12}$, 2 and $\frac{8}{3}$ in decreasing order.

Use ⬕ or a number line to compare.

Convert the improper fractions into mixed numbers.

$$\frac{19}{6} = 3\frac{1}{6} \qquad\qquad\qquad \frac{8}{3} = 2\frac{2}{3}$$

9

Comparing the whole numbers,
2 is the smallest.

$2\frac{11}{12}$ and $\frac{8}{3}$ are smaller than $\frac{19}{6}$.

So, $\frac{19}{6}$ is the greatest.

Compare $2\frac{11}{12}$ and $\frac{8}{3}$.

$$\frac{8}{3} = 2\frac{2}{3} = \boxed{}$$

$\boxed{} > \boxed{}$.

Arranging the fractions in decreasing order, we have

$\boxed{}$, $\boxed{}$, $\boxed{}$, $\boxed{}$

1. Which fraction is greater?

   (a) $3\frac{5}{9}$ or $3\frac{2}{9}$

   (b) $2\frac{3}{4}$ or $2\frac{1}{2}$

   (c) $\frac{8}{3}$ or $\frac{5}{6}$

   (d) $\frac{9}{12}$ or $\frac{7}{6}$

   (e) $4\frac{3}{5}$ or $\frac{25}{10}$

   (f) $3\frac{1}{4}$ or $2\frac{1}{16}$

2. Which fraction is smaller?

   (a) $2\frac{5}{6}$ or $2\frac{3}{12}$

   (b) $3\frac{7}{10}$ or $3\frac{3}{5}$

   (c) $\frac{16}{7}$ or $\frac{18}{7}$

   (d) $\frac{31}{20}$ or $\frac{21}{4}$

   (e) $5\frac{5}{9}$ or $\frac{43}{9}$

   (f) $1\frac{9}{10}$ or $\frac{9}{5}$

3. Arrange the fractions in increasing order.

   (a) $2\frac{1}{6}, \frac{7}{2}, \frac{17}{6}$

   (b) $3\frac{4}{5}, 3, \frac{13}{5}, 2\frac{1}{15}$

4. Arrange the fractions in decreasing order.

   (a) $4\frac{1}{14}, \frac{32}{7}, 4\frac{2}{7}$

   (b) $\frac{50}{18}, 5, \frac{9}{2}, 5\frac{4}{18}$

ADD AND SUBTRACT FRACTIONS

1. Add.

   (a) $\dfrac{2}{3} + \dfrac{1}{4} + \dfrac{1}{2} =$

   (b) $1\dfrac{2}{5} + \dfrac{2}{3} + 2\dfrac{3}{5} =$

   (c) $2\dfrac{1}{7} + \dfrac{1}{2} + 3\dfrac{2}{14} =$

2. Subtract.

   (a) $3\dfrac{1}{5} - \dfrac{1}{3} - 1\dfrac{1}{2} =$

   (b) $2\dfrac{2}{3} - \dfrac{1}{2} - \dfrac{3}{4} =$

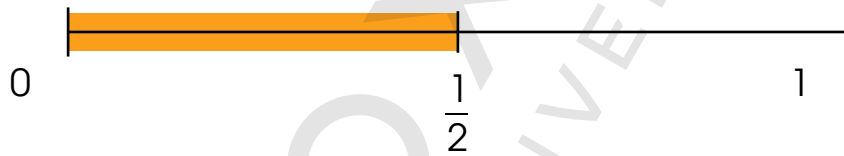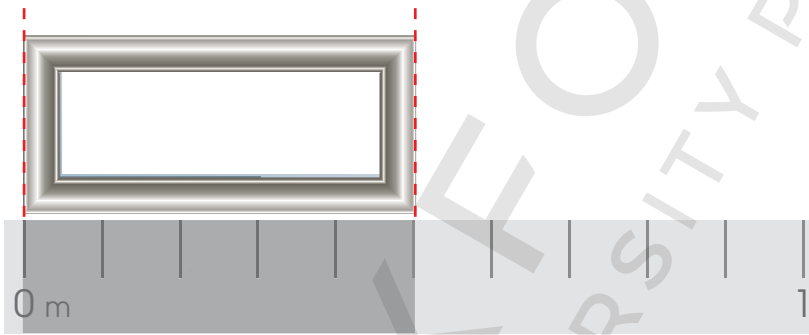   (c) $5\dfrac{2}{7} - 1\dfrac{1}{7} - \dfrac{1}{2} =$

FRACTIONS AND DECIMALS

IN FOCUS

A photo frame has a length of $\frac{1}{2}$ m.

How do we write the length of the photo frame as a decimal?

1.

0 m   1

0       $\frac{1}{2}$ 1

Using a metre ruler, the length of the photo frame is $\frac{1}{2}$ m.

0   0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8   0.9   1
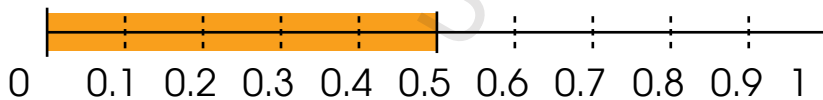
$$\frac{1}{2} = \frac{5}{10}$$
$$= 0.5$$

$\frac{1}{2}$ m written as a decimal is 0.5 m.

We convert the denominator to 10 to find the number of tenths.

× 5

$\frac{1}{2}$ = $\frac{5}{10}$

× 5

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2. Express $\frac{1}{5}$ as a decimal.
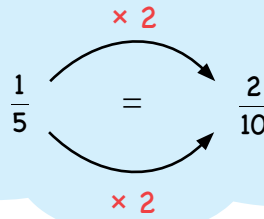
$\frac{1}{5} = \frac{2}{10}$

$\phantom{\frac{1}{5}} = \boxed{}$

Convert the denominator to 10.

$\times 2$

$\frac{1}{5} = \frac{2}{10}$

$\times 2$

3. Express $\frac{1}{4}$ as a decimal.

$\frac{1}{4} = \frac{25}{100}$

$\phantom{\frac{1}{4}} = 0.25$

We cannot convert the denominator to 10 but we can convert it to 100.

$\times 25$

$\frac{1}{4} = \frac{25}{100}$

$\times 25$
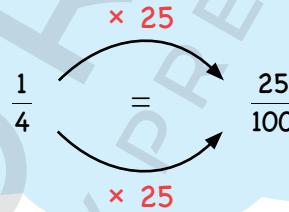
4. Express $\frac{9}{20}$ as a decimal.

$\frac{9}{20} = \frac{45}{100}$

$\phantom{\frac{9}{20}} = \boxed{}$

$\times \boxed{}$

$\frac{9}{20} = \frac{45}{100}$

$\times \boxed{}$
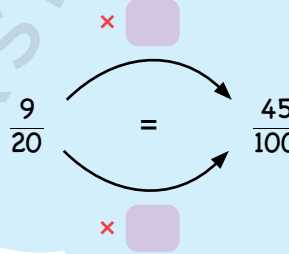
5. Express $1\frac{1}{2}$ as a decimal.

$1\frac{1}{2} = 1\frac{5}{10}$

$\phantom{1\frac{1}{2}} = 1.5$

$\times \boxed{}$

$\frac{1}{2} = \frac{5}{10}$

$\times \boxed{}$
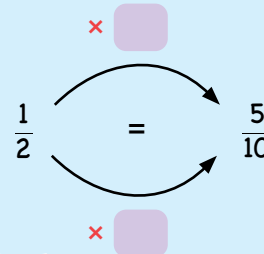
6. Express $2\frac{3}{4}$ as a decimal.

$2\frac{3}{4} = 2\frac{\boxed{}}{100}$

$\qquad = \boxed{}$

$\times \boxed{}$

$\frac{3}{4} = \dfrac{\boxed{}}{100}$

$\times \boxed{}$
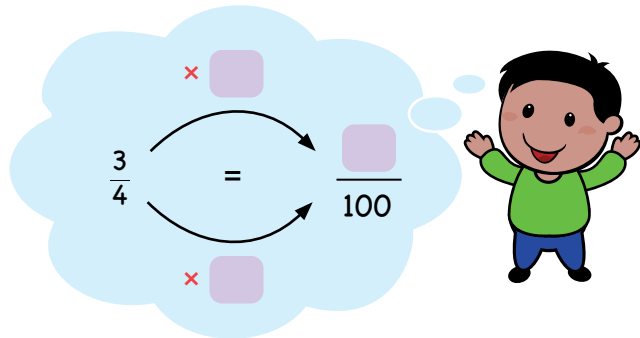
7. Express 0.6 as a fraction in its simplest form.

$0.6 = \dfrac{6}{10}$

$\qquad = \dfrac{3}{5}$

What is the common factor used to divide both the numerator and denominator to get the simplest form?
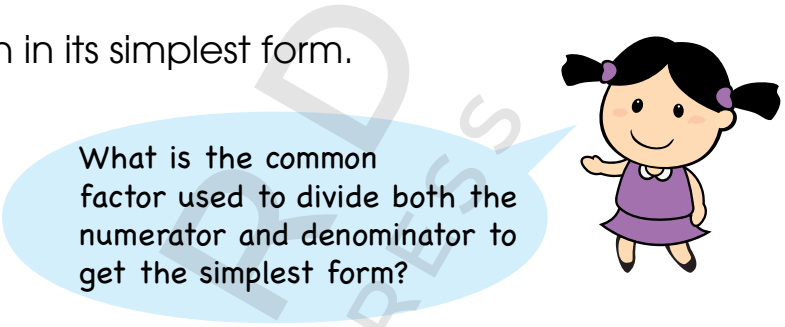
8. Express 0.35 as a fraction in its simplest form.

$0.35 = \dfrac{35}{100}$

$\qquad = \dfrac{\boxed{}}{\boxed{}}$

9. Express 3.25 as a mixed number in its simplest form.

$3.25 = 3\dfrac{25}{100}$

$\qquad = 3\dfrac{\boxed{}}{\boxed{}}$

10. Express each of the following as a fraction or a mixed number. Leave each answer in its simplest form.

(a)   0.8

(b)   0.25

(c)   2.6

(d)   5.45

15

1. Express each of the fractions as a decimal.

   (a) $\dfrac{3}{5}$ (b) $3\dfrac{1}{2}$

   (c) $\dfrac{3}{20}$ (d) $5\dfrac{3}{4}$

2. Express each of the following as a fraction or a mixed number. Leave each answer in its simplest form.

   (a) 0.05 (b) 0.13

   (c) 2.04 (d) 7.35

MIND WORKOUT

The cost of a beef burger is rounded to the nearest dollar.
It costs approximately $4.
What is the highest and lowest possible cost of the beef burger?

When we round to the nearest dollar, we round the cost to the nearest whole number.

Use a number line to help you.

COMPARING AND ORDERING DECIMALS

IN FOCUS

0.35 m

0.4 m

Which ribbon is longer?

1. Compare 0.35 and 0.4.

0.35
0.4

| 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
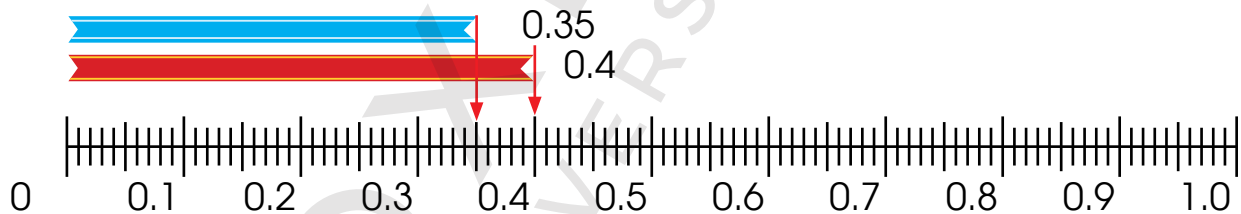
We can also compare using the place-value chart.

Ones	Tenths	Hundredths
0	4	
0	3	5

What should we compare first?

4 tenths < 3 tenths.
0.4 > 0.35.

The red ribbon is longer than the blue ribbon.

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2. Which is smaller, 2.567 or 2.57?

2.567   2.57

2.56   2.565   2.57
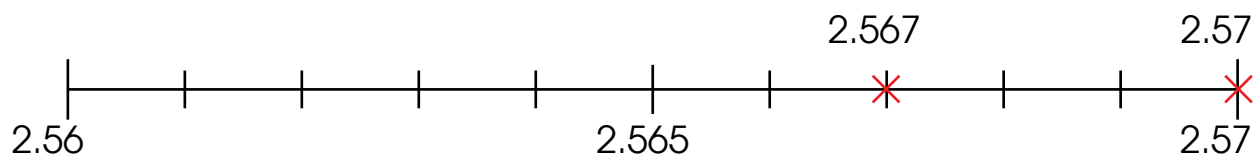
☐ hundredths < ☐ hundredths.

☐ < ☐ .

3. Compare the numbers 3.6, 3.06 and 3.066.
Arrange these numbers in decreasing order.

Ones	Tenths	Hundredths	Thousandths
3	6		
3	0	6	
3	0	6	6

6 tenths > 0 tenths.
3.6 is the greatest.

All numbers have 3 ones.
What should we compare?

Both 3.066 and 3.06 have 6 hundredths.
What should we compare next?

Compare 3.06 and 3.066.

6 thousandths > 0 thousandths.
3.066 > 3.06.

3.6,   3.066,   3.06
greatest ⟶ smallest

4. Compare using < and >.

Use ⬤ and ⬤ to help you.

(a) 0.58 ☐ 0.6

(b) 0.456 ☐ 0.465

(c) 0.371 ☐ 0.137

5. (a) Which is the greatest, 0.371, 0.173 or 0.713?

(b) Which is the smallest, 3.76, 3.067 or 3.076?

6. Arrange the decimals in decreasing order.
Use a number line to help you.

(a) 1.37, 1.371, 1.731

(b) 3, 3.02, 3.014, 3.023

7. Arrange the decimals in increasing order.
Use a number line to help you.

(a) 1.003, 0.154, 0.64

(b) 2.27, 2.3, 2.283, 2.238

Students' Learning Outcomes:
- Add and subtract numbers up to three decimal places.
- Multiply numbers up to two decimal places by:
  » up to 2-digit whole numbers.
  » 3-digit numbers with up to two decimal places.

ADDITION, SUBTRACTION, AND MULTIPLICATION OF DECIMAL NUMBERS

1. Add

(a) 69.82 + 32.09 =

(b) 0.563 + 2.535 =

(c) 27.104 + 10.624 =

2. Subtract

(a) 83.07 - 25.13 =

(b) 46.826 - 31.659 =

(c) 77.909 - 48.005 =

3. Multiply.

(a) 3.57 x 22 =

(b) 14.02 x 53 =

(c) 65.15 x 3.4 =

(d) 87.24 x 1.62 =

Students' Learning Outcome:
- Divide numbers up to two decimal places by:
  » up to 2-digit whole numbers
  » 2-digit numbers with one decimal place.

DIVISION OF DECIMAL NUMBERS

Divide

a) $5.52 \div 24$	d) $2.72 \div 1.7$
b) $4.42 \div 13$	e) $4.95 \div 4.5$
c) $7.13 \div 31$	f) $9.36 \div 1.3$

Hint: First convert divisor into a whole number and then divide.

To remove the decimal point of the divisor, multiply the numerator and the denominator by 10.

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SQUARE NUMBERS

When a number is multiplied by itself, the result is a square number.
For example, 16 is a square number because

$$4 \times 4 = 16$$

16 is a square of 4.
This is also written as 4^2 (4 squared).
Similarly,

$1^2 = 1 \times 1 = 1$	$6^2 = 6 \times 6 = 36$	
$2^2 = 2 \times 2 = 4$	$7^2 = 7 \times 7 = 49$	
$3^2 = 3 \times 3 = 9$	$8^2 = 8 \times 8 = 64$	
$4^2 = 4 \times 4 = 16$	$9^2 = 9 \times 9 = 81$	
$5^2 = 5 \times 5 = 25$	$10^2 = 10 \times 10 = 100$	

All these numbers are square numbers.

CUBE NUMBERS

A cube number is the result when a number is multiplied by itself three times.
For example, 64 is a cube number because

$$4 \times 4 \times 4 = 64$$

64 is a cube of 4.
This is also written as 4^3 (4 cubed).
Similarly,

$1^3 = 1 \times 1 \times 1 = 1$	$6^3 = 6 \times 6 \times 6 = 216$
$2^3 = 2 \times 2 \times 2 = 8$	$7^3 = 7 \times 7 \times 7 = 343$
$3^3 = 3 \times 3 \times 3 = 27$	$8^3 = 8 \times 8 \times 8 = 512$
$4^3 = 4 \times 4 \times 4 = 64$	$9^3 = 9 \times 9 \times 9 = 729$
$5^3 = 5 \times 5 \times 5 = 125$	$10^3 = 10 \times 10 \times 10 = 1000$

All these numbers are cube numbers.

NUMBER PATTERNS

RECAP

Look at the number patterns.
What is the next number in each pattern?

| 177 | 277 | 377 | 477 | 577 | 677 | 777 | ? |

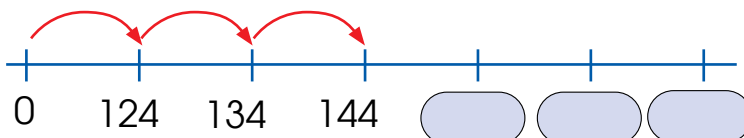| 830 | 825 | 820 | 815 | 810 | 805 | 800 | ? |
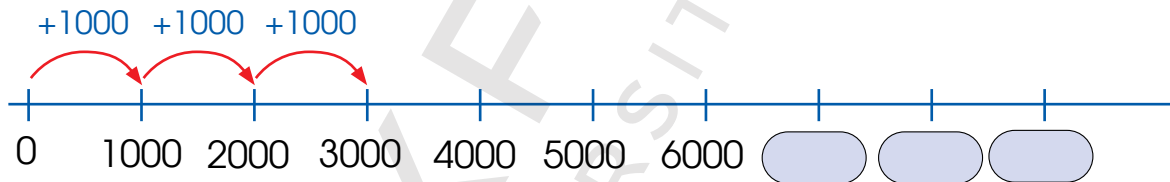
From above pattern, we can see that we get the next number by adding 1000 each time. This is called the rule of the pattern.

Rule: Start with 0 and add 1000.

Similarly, we can extend the pattern using the above given rule.

1. Write the rule for the following pattern. Extend the pattern for next 3 terms.

2. Write the rule and write the missing values for the following patterns.

35	40	45		

Rule: _____

80	70		50	

Rule: _____

137600	247600		467600	

Rule: _____

94359	84359			54359	44359		

Rule: _____

3. Write the number pattern in green and describe the rule.
   Colour your own patterns and describe the rule.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Students' Learning Outcomes:
• Convert larger units to smaller units of time and vice versa.
• Add, subtract, and convert measure and intervals of time to solve real-life word problems.

CONVERSION OF UNITS OF TIME

1. A football match lasted for 105 minutes.

60 min later   ☐ min later

What was the duration in hours and minutes?

105 min = 60 min + ☐ min

= ☐ hr ☐ min

Try using a timeline to help you.

2. A birthday party lasted for 185 minutes.
What was the duration in hours and minutes?

185 min = ☐ min + ☐ min

= ☐ hr ☐ min

60 min   = 1 hr
120 min = 2 hr

☐ min = 3 hr

3. A plane flight lasts for 250 minutes.
Write the duration in hours and minutes.

250 min = ☐ min + ☐ min

= ☐ hr ☐ min

4. A musician performed for 600 seconds.

How long did he perform in minutes and seconds?

600 sec = ☐ sec + ☐ sec

= ☐ min ☐ sec

1. Write in hours and minutes.

(a) 95 min

(b) 175 min

(c) 205 min

2. Write in minutes and seconds.

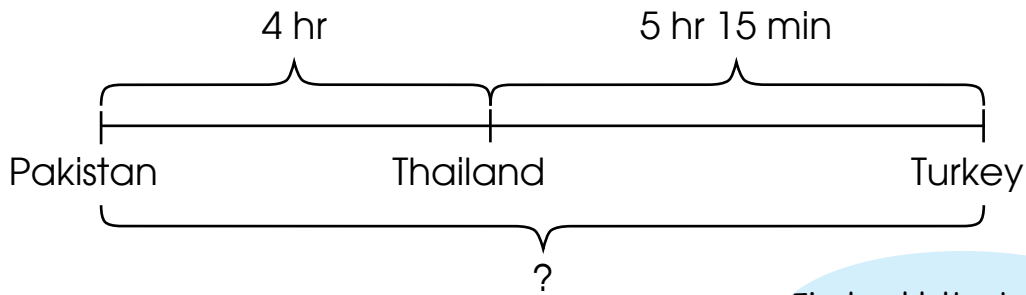(a) 78 sec

(b) 125 sec

(c) 212 sec

SOLVING WORD PROBLEMS

IN FOCUS

Asma and her family travelled from Pakistan to Thailand for 4 hr. They then travelled another 5 hr 15 min from Thailand to Turkey. How much time did they spend travelling?

1.

4 hr	5 hr 15 min

Pakistan　　　　　Thailand　　　　　Turkey

?

4 hr + 5 hr 15 min = ?

First, add the hours.
Then add the minutes.

4 hr $\xrightarrow{+5 \text{ hr}}$ 9 hr $\xrightarrow{+15 \text{ min}}$ 9 hr 15 min

They spent 9 hr 15 min travelling.

2. Mrs Lee took 1 hr 10 min to shop for groceries.
She spent another 1 hr 55 min to shop for presents.
What was the total time she spent shopping?

1 hr 10 min	1 hr 55 min

?
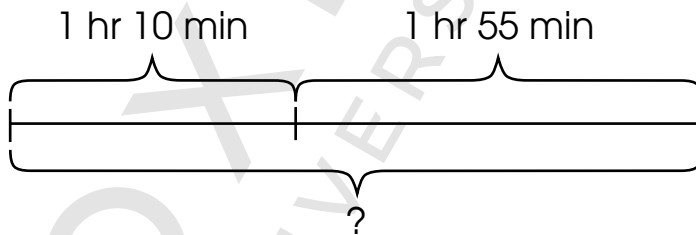
1 hr 10 min + 1 hr 55 min = ?

1 hr 10 min $\xrightarrow{+1 \text{ hr}}$ 2 hr 10 min $\xrightarrow{+55 \text{ min}}$ 2 hr 65 min

65 min = 60 min + 5 min = 1 hr 5 min

2 hr 65 min = ☐ hr ☐ min

Mrs Lee spent ☐ hr ☐ min shopping.

3. Nora spent 2 hr 40 min reading.
She then spent 1 hr 5 min watching television.
How much longer did she spend reading than watching television?

2 hr 40 min

1 hr 5 min

?
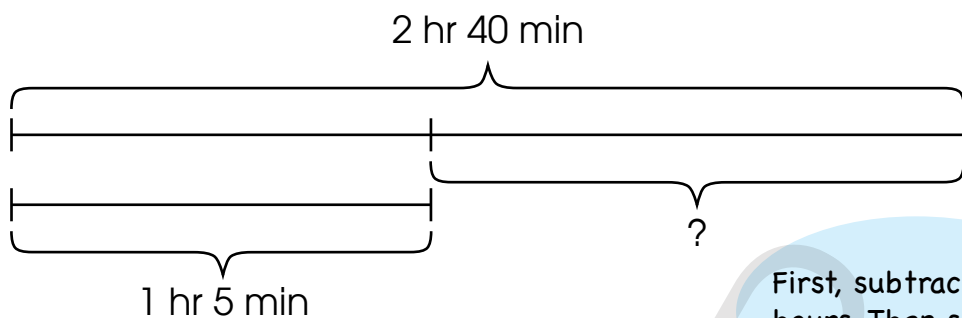
2 hr 40 min – 1 hr 5 min = ?

First, subtract the hours. Then subtract the minutes.

2 hr 40 min $\xrightarrow{-1\ hr}$ ☐ hr ☐ min $\xrightarrow{-5\ min}$ ☐ hr ☐ min

Nora spent ☐ hr ☐ min longer reading than watching television.

4. Farhan takes 50 minutes to travel to the library.
He takes 1 hr 20 min to travel to school.
How much longer does he take to travel to school than to the library?

50 min

?
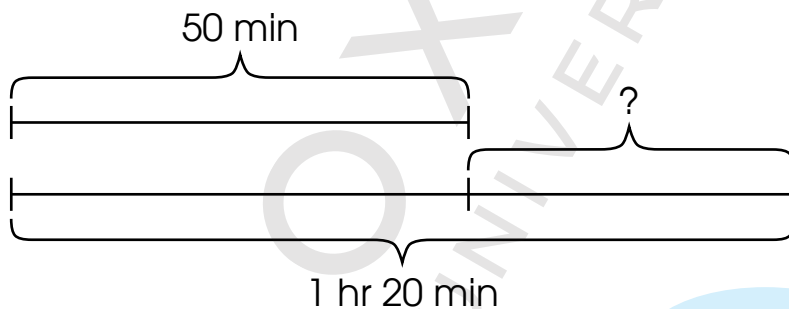
1 hr 20 min

We cannot subtract 50 min from 20 min, so we change 1 hr 20 min to min.

1 hr 20 min – 50 min = ?

1 hr 20 min = ☐ min + ☐ min

= ☐ min

☐ min $\xrightarrow{-50\ min}$ ☐ min

Farhan takes ☐ min longer to travel to school than to the library.

5. Ann spent 80 minutes jogging.
She then spent another 85 minutes walking.
(a) What was the total time she spent on exercising?
Give your answer in hours and minutes.
(b) Ann started jogging at 11.15 a.m.
What time did she finish exercising?

(a) 80 min + 85 min = ⬜ min

⬜ min = ⬜ hr ⬜ min

She spent a total of ⬜ hr ⬜ min exercising.

(b)

⬜ hr ⬜ min

11.15 a.m.

She finished exercising at ⬜ .
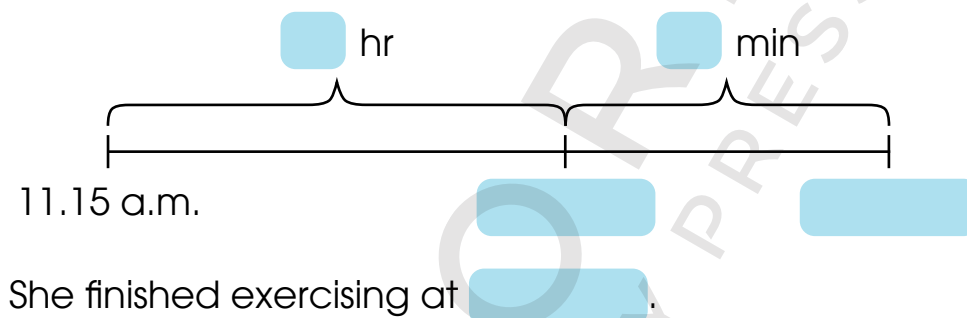
Solve.

1. Meiling spent 1 hr 35 min doing homework.
She spent another 1 hr 55 min reading a book.
How much time did she spend doing homework and reading altogether?

2. Tom took 2 hr 15 min to complete a walkathon.
Ahmad took 70 minutes to complete the same walkathon.
How much longer did Tom take to complete the walkathon
than Ahmad?

3. Nora cycled for 1 hr 55 min.
The total time that Nora and Priya cycled was 5 hr 45 min.
(a) How long did Priya cycle?
(b) Priya started cycling at 8.10 a.m. What time did she finish cycling?

4. Mr Wong works from 11.30 a.m. to 4.30 p.m. every day.
He is paid Rs 1750 each hour.
How much is he paid in one day?

AREA AND PERIMETER

Find the area and perimeter of the following shape.

A   3 cm

4 cm

B   2 cm

6 cm
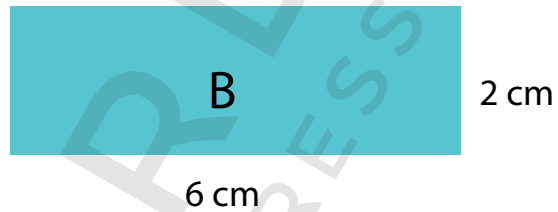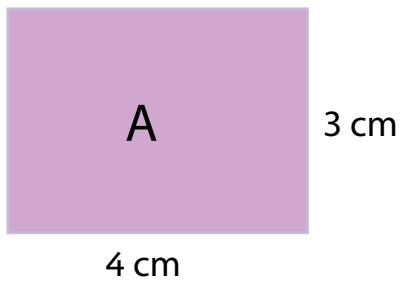
Area of shape A =

Area of shape B =

Perimeter of shape A =

Perimeter of shape B =

What do you notice from the above results?

AREA OF TRIANGLES

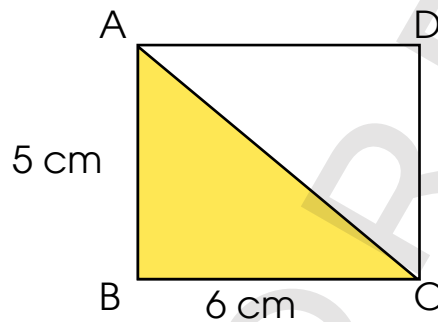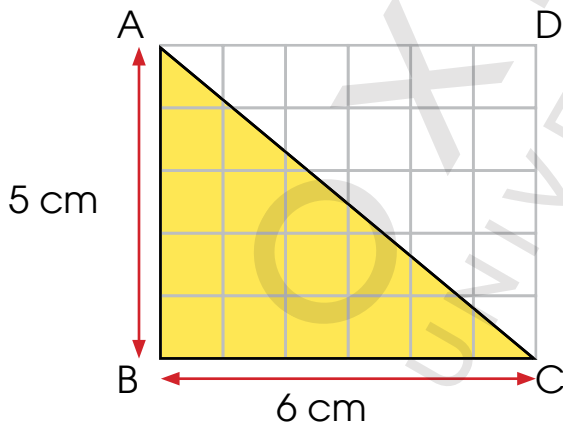What is the area of rectangle ABCD? How can we use the area of the rectangle to find the area of triangle ABC?

1. In triangle ABC, AB is the height and BC is the base of the triangle. Find its area.

> The base of triangle ABC is the same as the length of rectangle ABCD. What do you notice about the height of the triangle and the breadth of the rectangle?
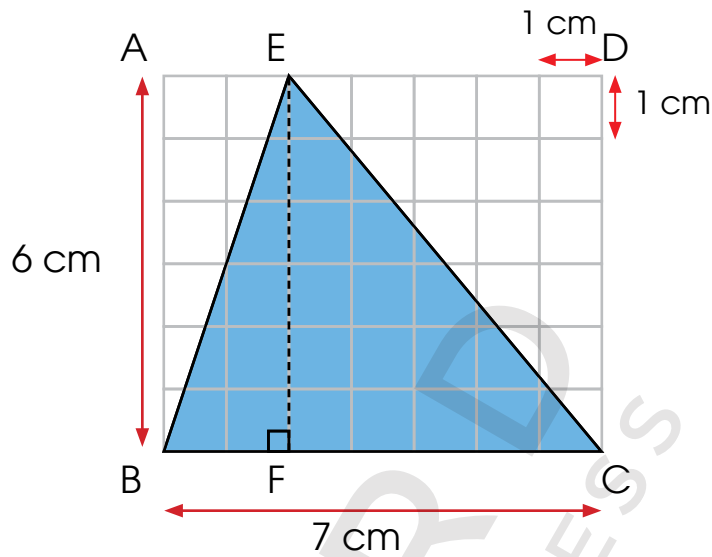
> Triangle ABC is half of rectangle ABCD.

Area of triangle ABC = $\frac{1}{2}$ × area of rectangle ABCD

$= \frac{1}{2} \times 6 \times 5$

$= 15 \text{ cm}^2$

Area of triangle = $\frac{1}{2}$ × Base × Height

31

2. Find the area of triangle EBC.

Area of triangle EBF $= \frac{1}{2} \times$ area of rectangle ABFE

$\qquad = \frac{1}{2} \times 6 \times 2$

$\qquad = 6$ cm²

Area of triangle EFC $= \frac{1}{2} \times$ area of rectangle EFCD

$\qquad = \frac{1}{2} \times 6 \times 5$

$\qquad = 15$ cm²

Area of triangle EBC $= 6 + 15$

$\qquad = 21$ cm²

> What is the area of rectangle ABCD? Compare the area of triangle EBC and the area of rectangle ABCD. What do you notice?
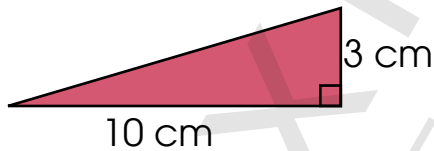
3. What is the area of triangle P?

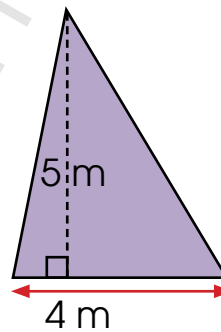> We can find the area of triangle P using the cut-and-paste method.

4 cm

5 cm

4 cm

5 cm
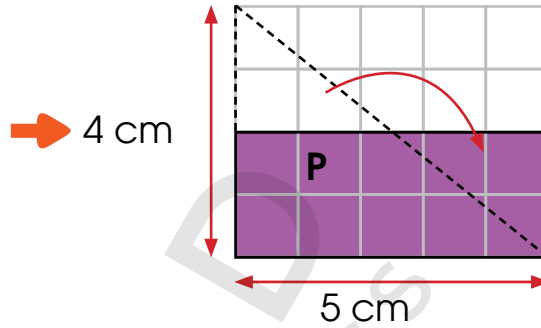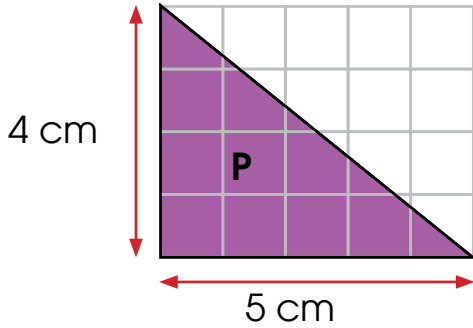
$$\text{Area of triangle P} = \frac{1}{2} \times 5 \times 4$$
$$= 10 \text{ cm}^2$$

4. What is the area of each of the following triangles? Explain how you find your answers.

(a)

3 cm
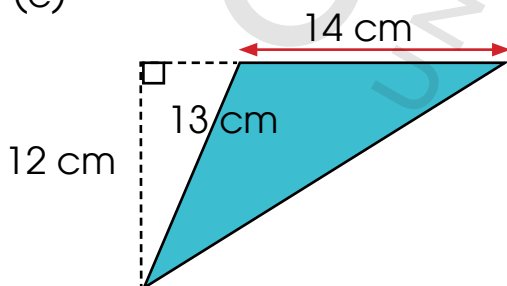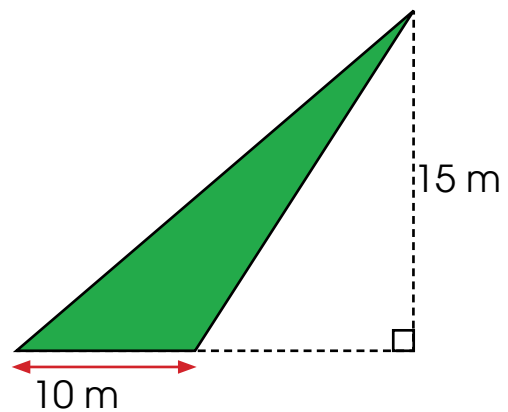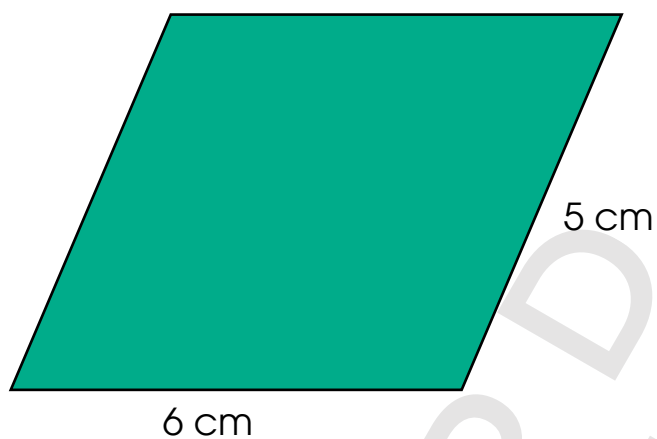
10 cm
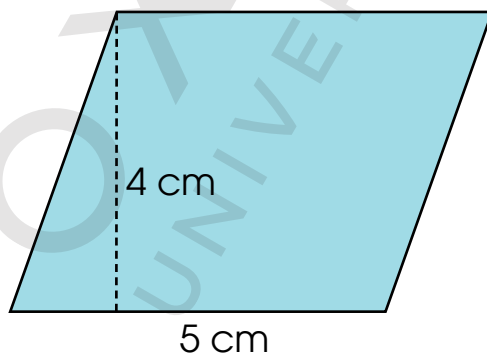
(b)

5 m

4 m

(c)

14 cm

13 cm

12 cm

(d)

15 m

10 m

5. Find the perimeter of the following parallelogram.

5 cm

6 cm

Perimeter = (6 + 6 + 5 + 5)cm

= ☐ cm

6. Find the area of the following parallelogram.

4 cm

5 cm

Area of parallelogram = base x height

= 5 x 4

= ☐ cm

Find the area of each triangle.

(a)

8 m

4 m

(b)

3 cm

4 cm   5 cm

(c)

10 m

3 m

8 m

(d)

20 cm

15 cm

36 cm   39 cm

(e)

5 m

6 m

8 m

(f)

12 cm

25 cm

8 cm

15 cm

35
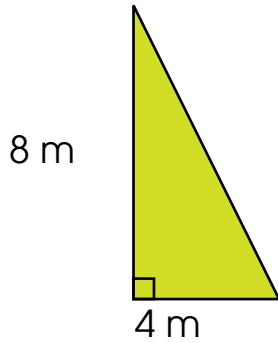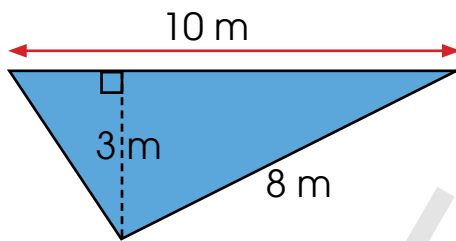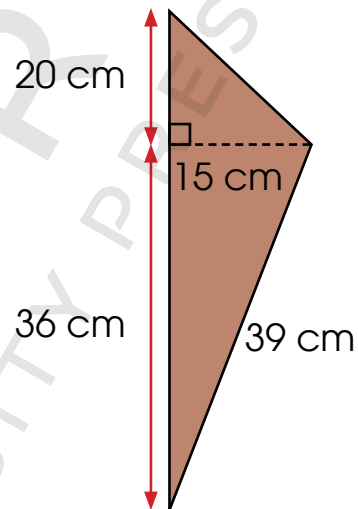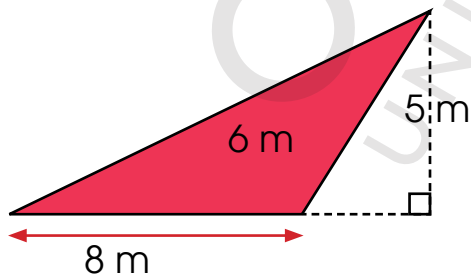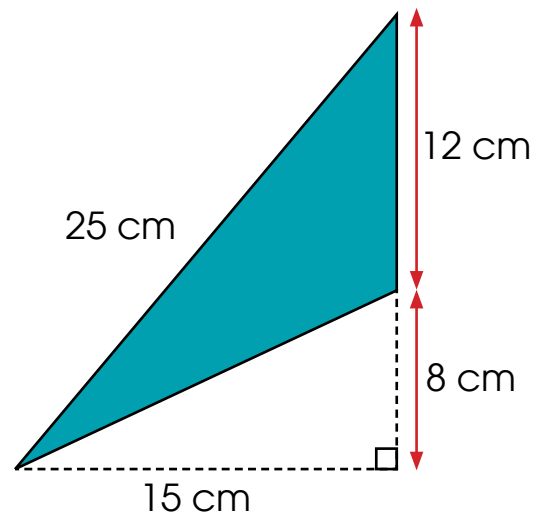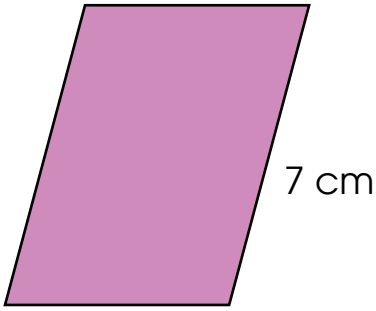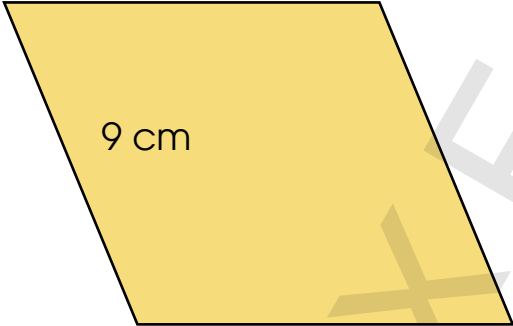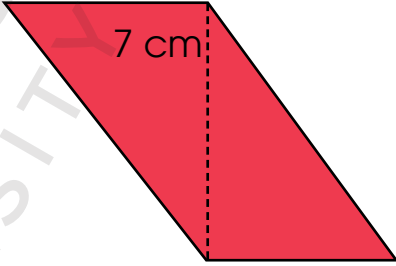
2. Find the area and perimeter.

7 cm

3 cm

Perimeter =_____

6 cm

8 cm

Area = _____

9 cm

8 cm

Perimeter =_____

7 cm

3 cm

Area = _____

KNOW YOUR QUADRILATERALS

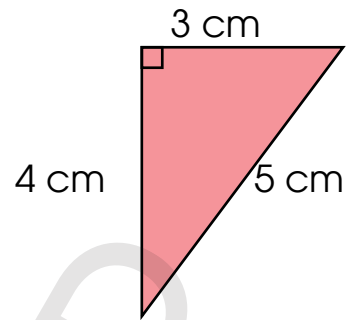| Clue	Drawing	Name of Shape
Two opposite sides are equal		Square, Rectangle, Parallelogram, Rhombus, Trapezium
All the sides are not equal		
All angles are equal		
Has no right angle		
Adjacent sides are equal		
Has parallel side		
Opposite angles are obtuse		

Draw the **quadrilaterals** to fill out the table appropriately.

Quadrilaterals

Match the quadrilaterals to their names.

Parallelogram
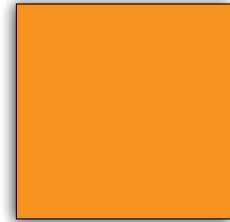
Kite
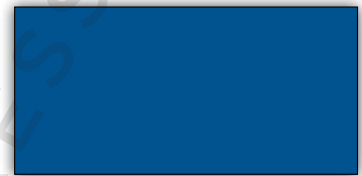
Square

Trapezium
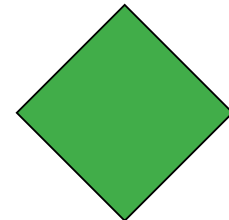
Rectangle
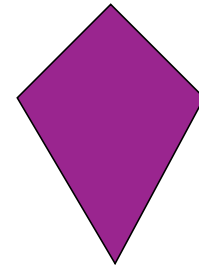
Rhombus
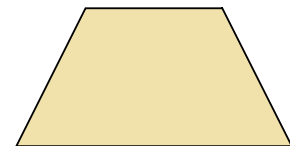
Students' Learning Outcome:
- Draw, read and interpret bar and line graphs.
- Interpret pie charts. (including real-world problems)

READING BAR GRAPHS

IN FOCUS

Waleed draws a picture graph to show the number of each type of fruit.

Orange	Pear	Strawberry
■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■

Each ■ stands for 1 fruit.

How can Waleed draw another graph to show the same information?

1. We can use a **bar graph** to show the number of each type of fruit.

Fruits We Have

Number
of fruits

The number of fruits can be read from the **scale**. How many fruits does each marking stand for?
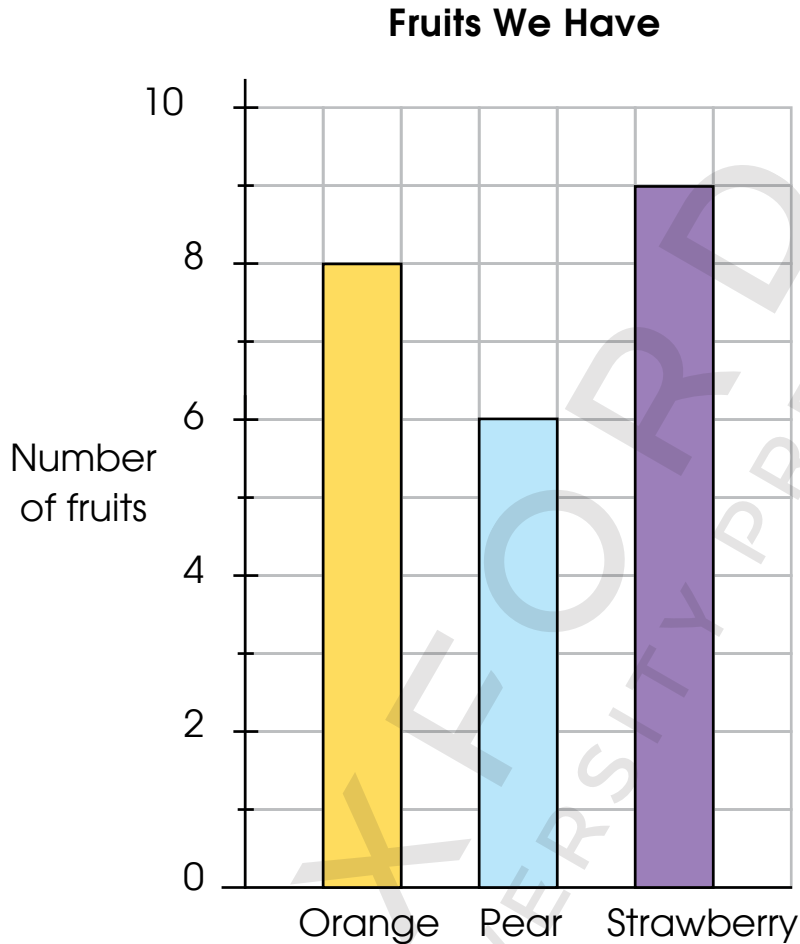
There are 6 pears.
There are 2 more oranges than pears.
The number of strawberries is the greatest.

How many strawberries are there?
How can you tell?

2. Different pastries are sold at a bakery each day.
The baker draws a bar graph to show the number of each type of pastry he sold in one day.

Types of Pastries Sold
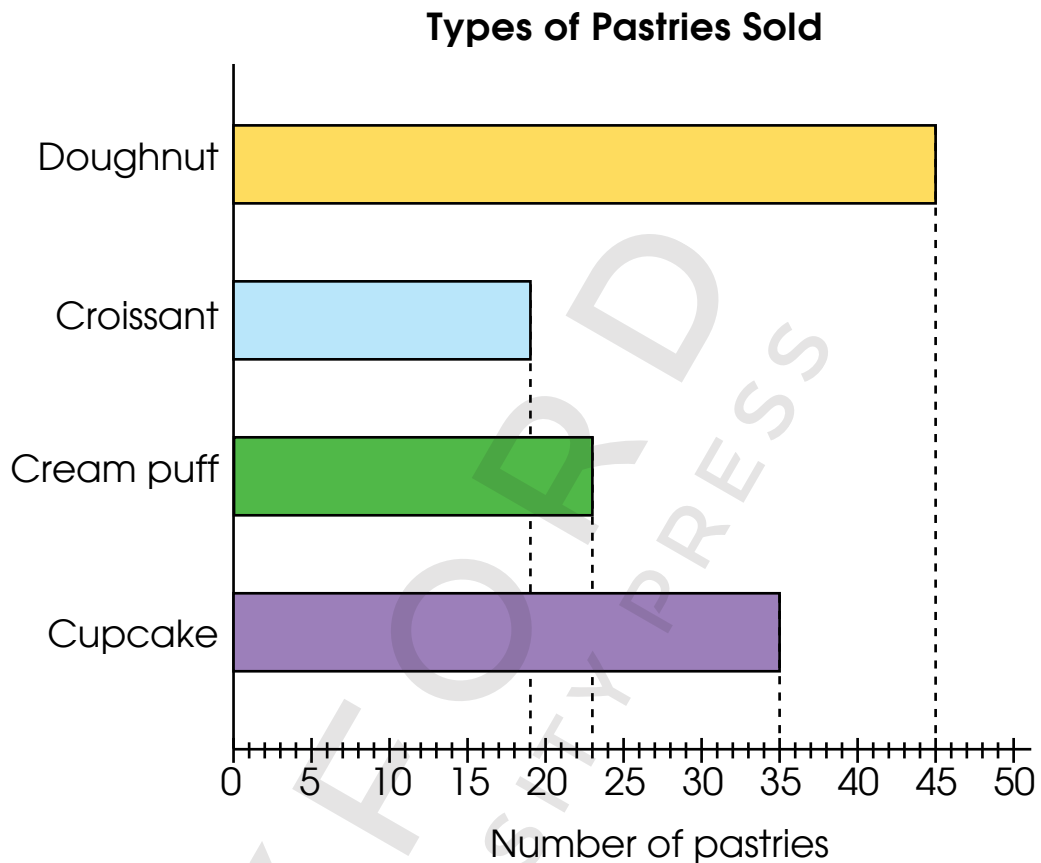
Look at the bar graph and answer the questions.

(a) How many doughnuts did the baker sell?

(b) How many cream puffs did the baker sell?

(c) Which type of pastry was the least popular?

(d) Did the baker sell more cream puffs or cupcakes?
How many more?

What other questions can you ask from the graph?

41

3. The bar graph shows the number of children who like different sports.

Favourite Sports
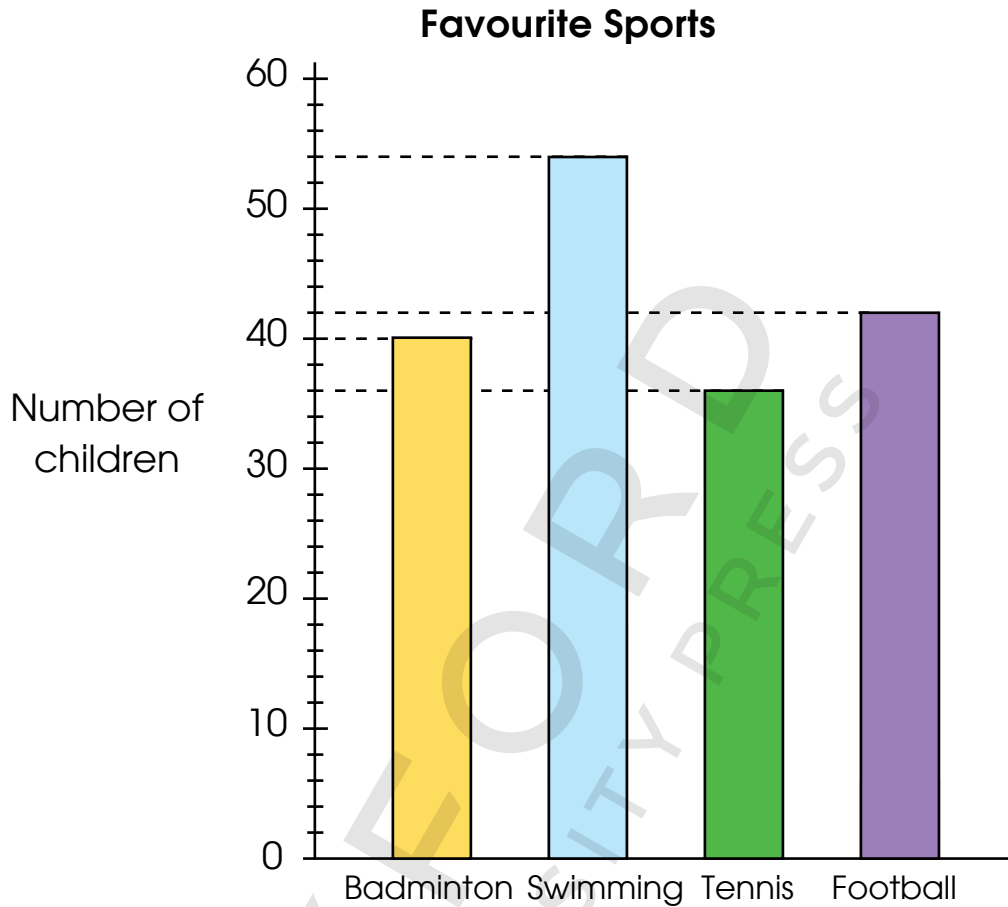
Three pupils are talking about the graph.
Whose statements are all correct?

Saif: Most of the pupils like swimming.
The number of pupils who like football is the smallest.

Bina: 14 more pupils like swimming than badminton.
Fewer than 40 pupils like tennis.

Farhan: 38 pupils like tennis.
More pupils like badminton than tennis.

4. Some pupils played a Mathematics game.
Their scores are shown in the bar graph.

Our Scores

Number of points
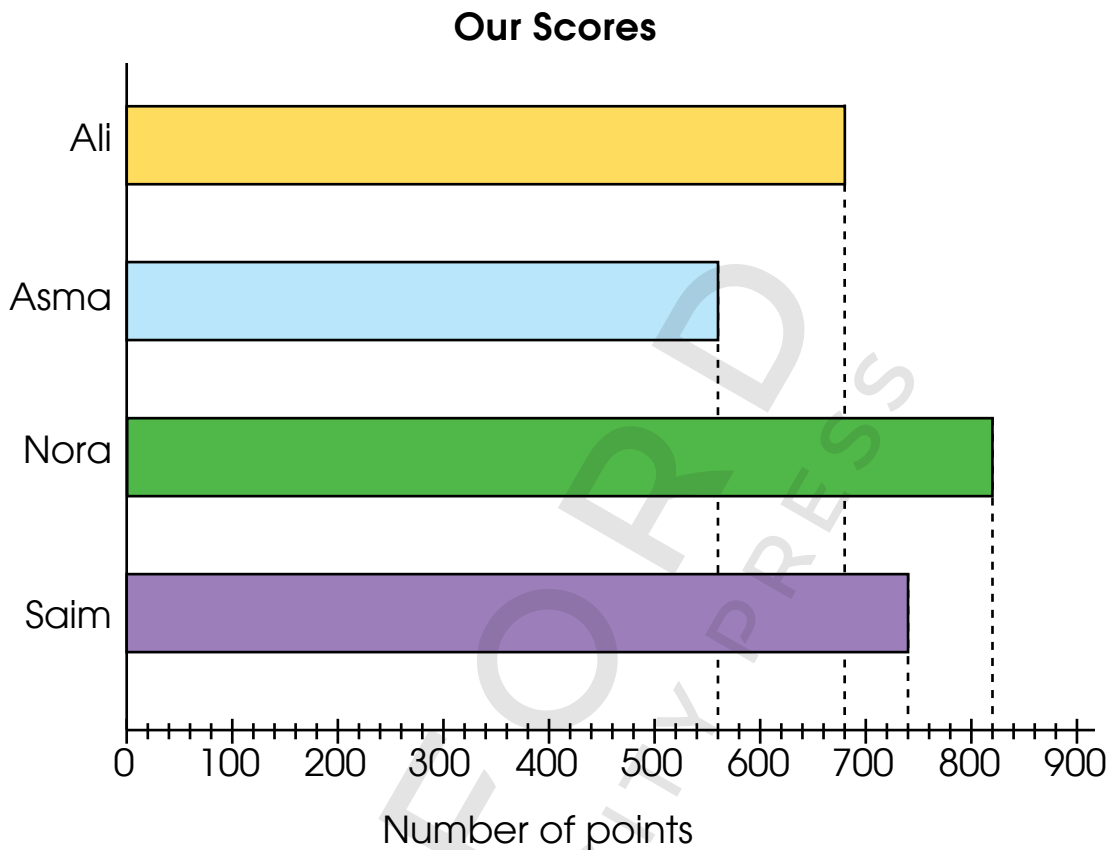
Look at the bar graph and answer the questions.

(a) Who has the lowest score?

(b) Whose score is higher, Ali or Saim?
How much higher?

(c) Who has the highest score?

(d) How many more points does Asma need
to have the same score as Nora?

1. The bar graph shows the number of children who like each type of food.

Favourite Food

Number of children

Biryani Haleem Karahi Pulao Tikka
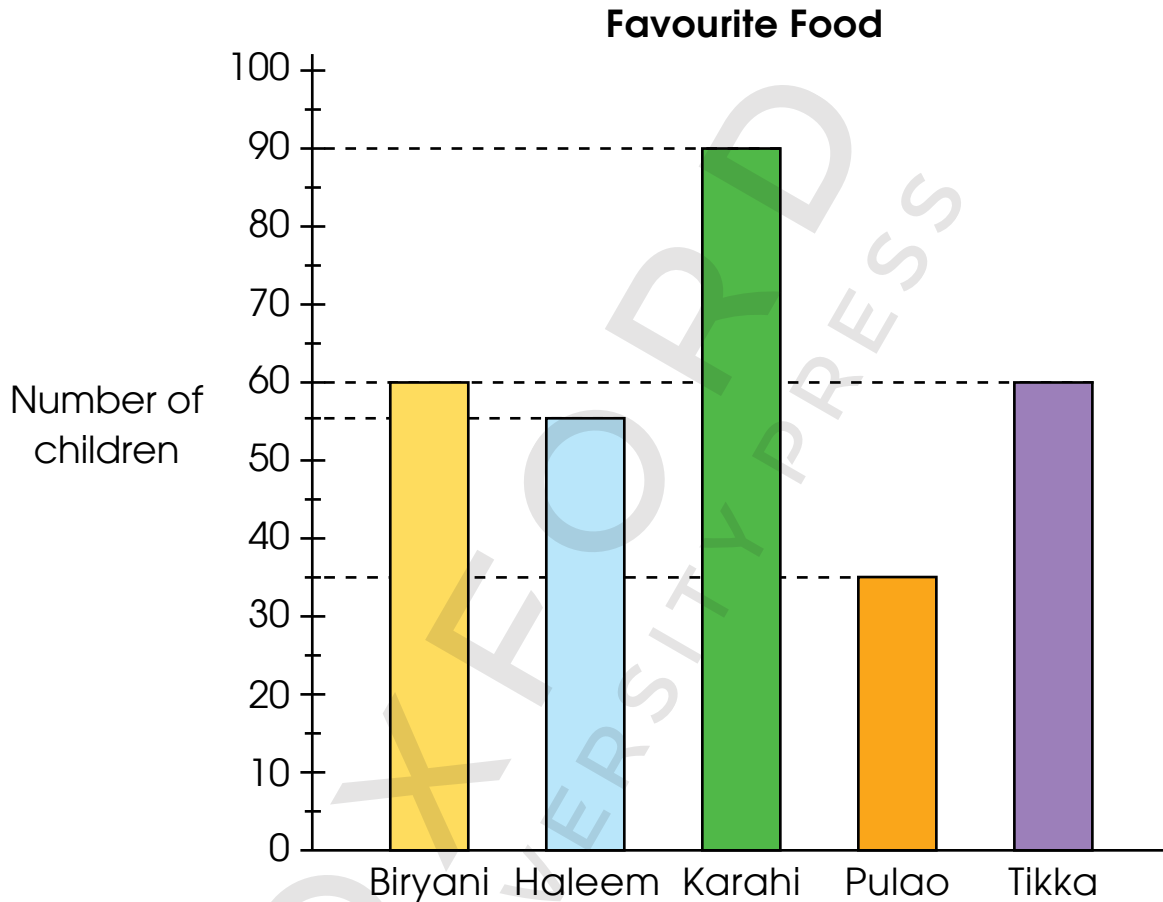
Look at the bar graph and answer the questions.

(a) Which type of food is the least popular?

(b) How many children like haleem?

(c) Do more children like biryani or karahi?
     How many more?

(d) The same number of children like ⬚ and ⬚.

2. The bar graph shows the number of children who visited the library over five days.

Visit to the Library
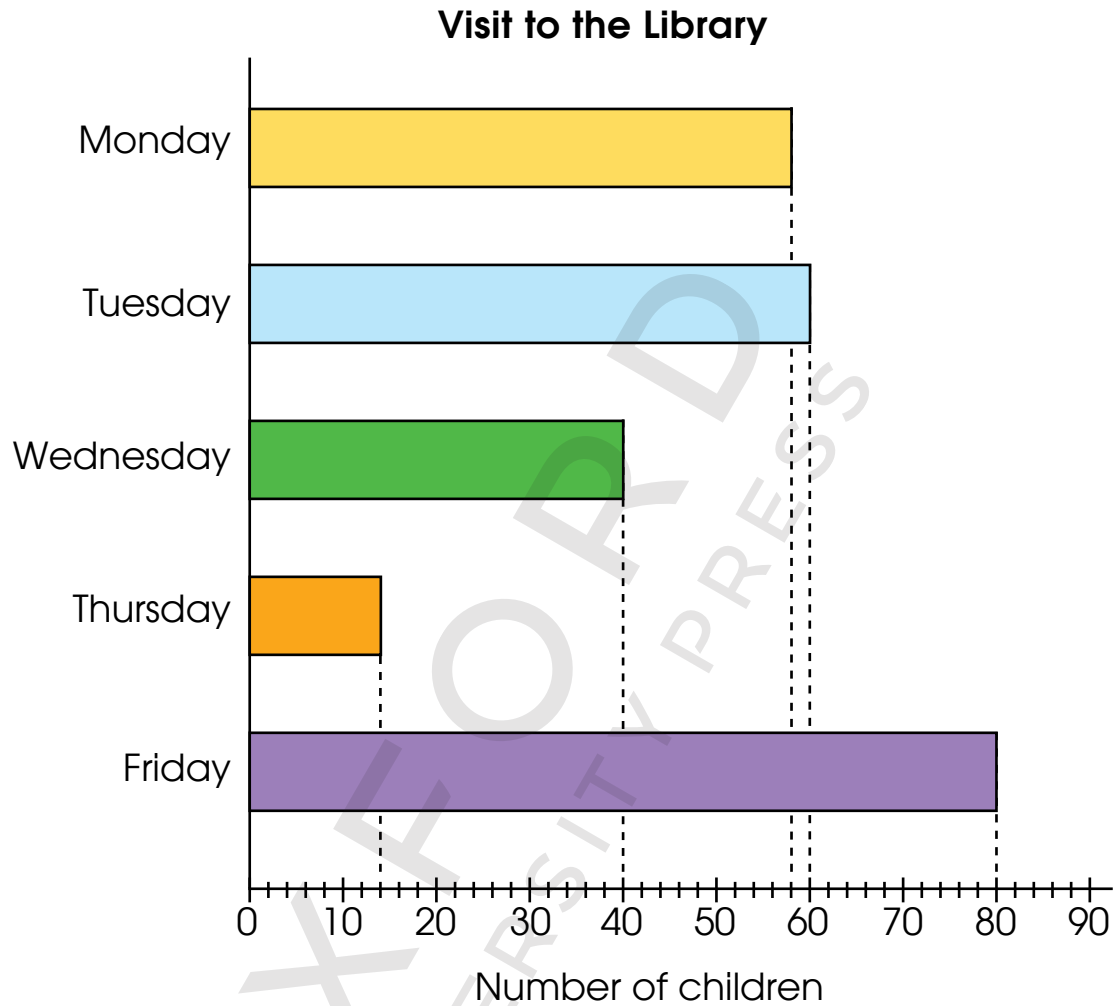
Look at the bar graph.

(a) ☐ children visited the library on Thursday.

(b) The greatest number of children visited the library on ☐ .

(c) 18 fewer children visited the library on ☐ than on Monday.

(d) Twice as many children visited the library on ☐ as on Wednesday.

LINE GRAPHS

IN FOCUS

Month	January	February	March	April
Number of books sold	92 000	80 000	55 000	53 000

We have learnt how to present the information in a bar graph.
How can we draw another graph to show the same information?

1. We can also use a **line graph** to show the number of books sold from January to April.

Sale of Books

Follow the red lines to find out the number of books sold in February.
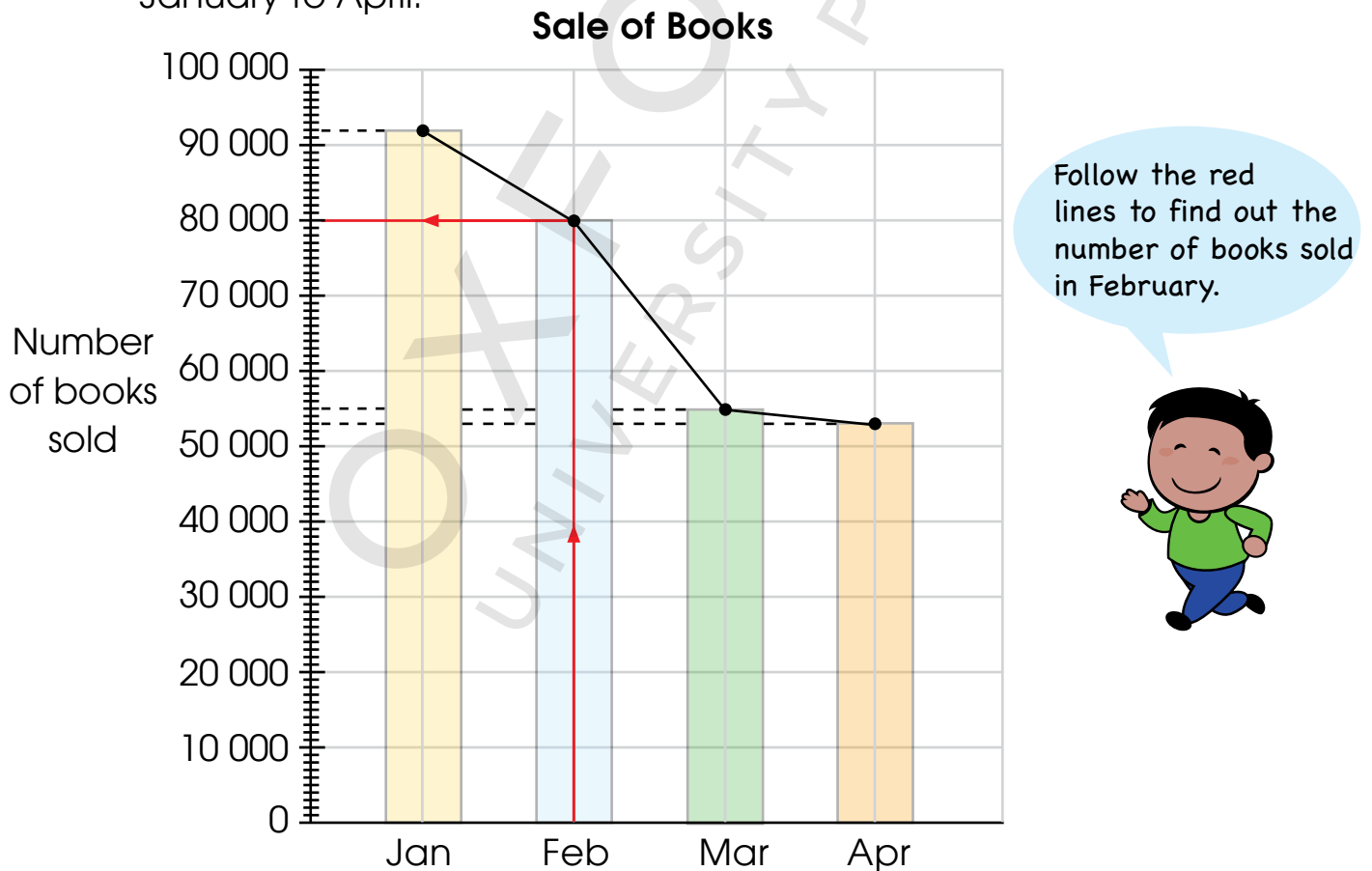
Each dot on the graph tells you the number of books sold in a particular month.

2. How did the sale of books change from January to April?

Sale of Books

Number of books sold

| | Jan | Feb | Mar | Apr |
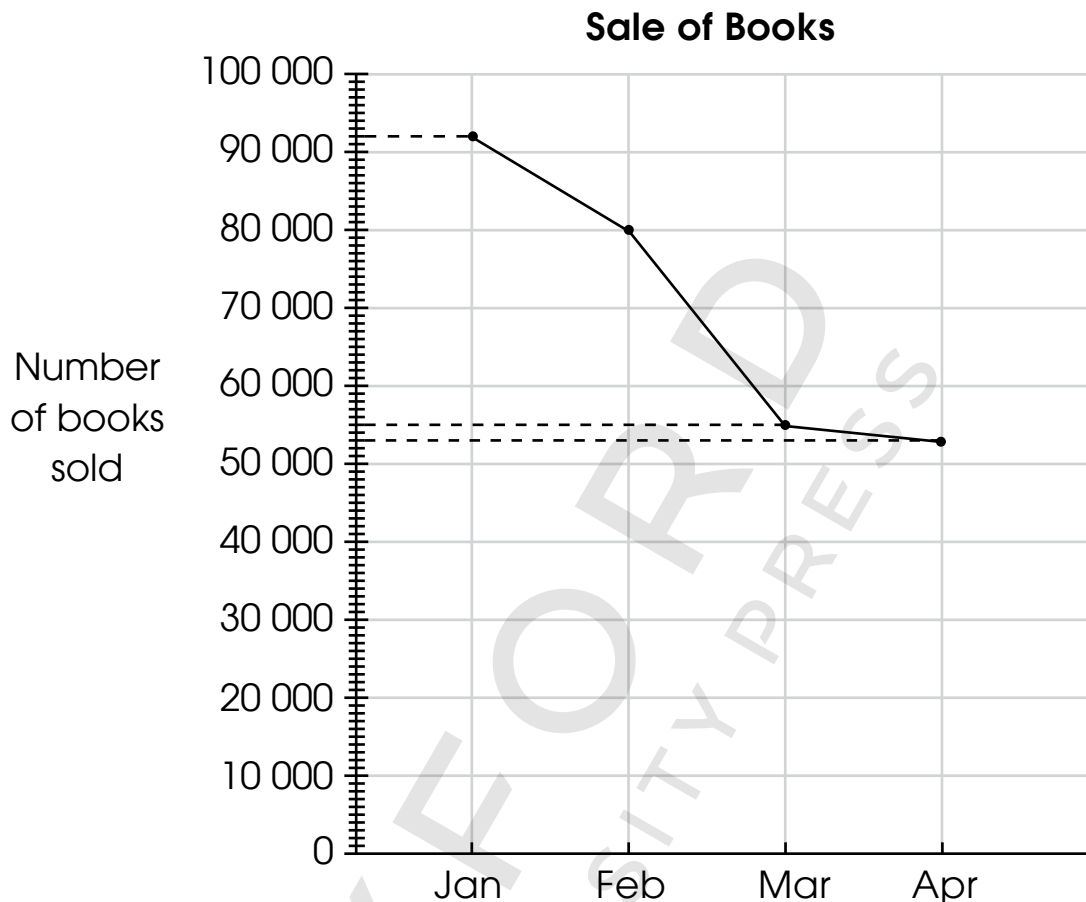
A line graph shows the pattern of information over time.

From the line graph, we can tell that the sale of books decreased from January to April.

We can also say that the number of books sold fell from January to April.

3. The line graph shows the prices of movie tickets in different years.

Price of a Movie Ticket
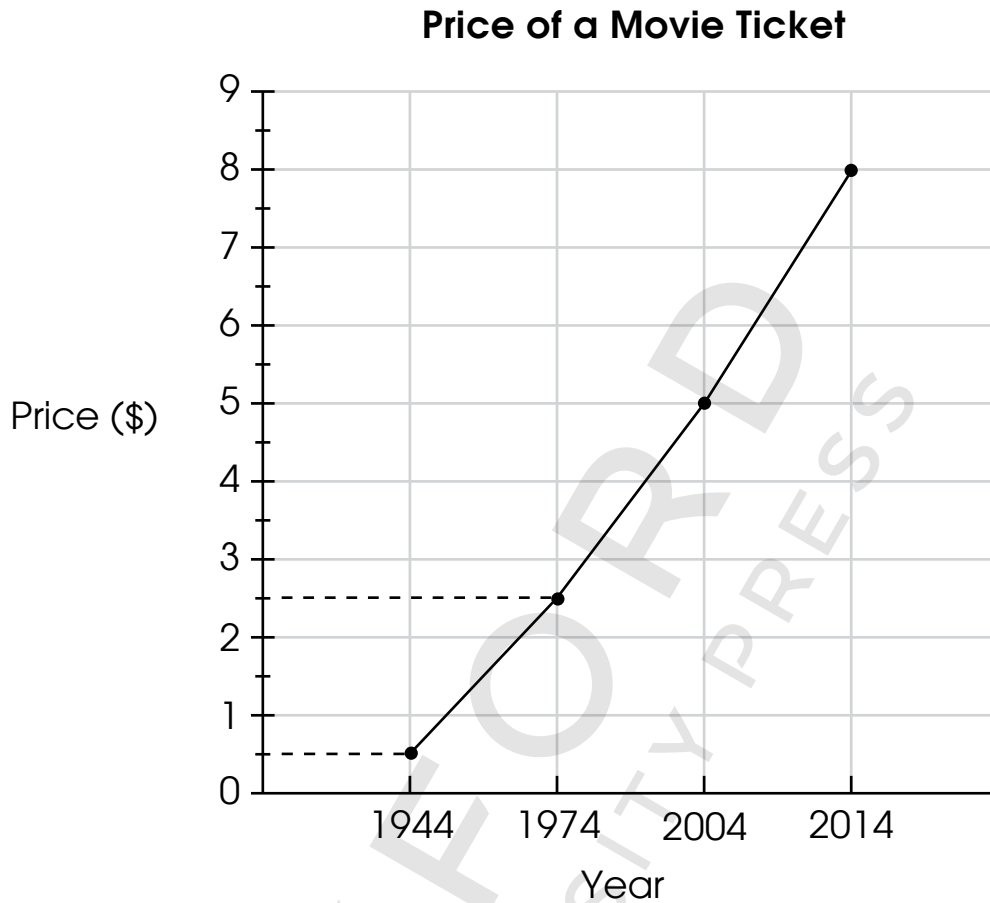
(a) What was the price of a movie ticket in 1974? $ ▢

(b) In which year was the price of a movie ticket the most
expensive?   ▢

(c) What is the difference between the price of a movie ticket
in 1944 and in 2004? $ ▢

> Did the price of the movie ticket increase or decrease over the years?

4. The line graph shows the change in the temperature of a glass of water left in a freezer over a period of time.

Temperature of Water
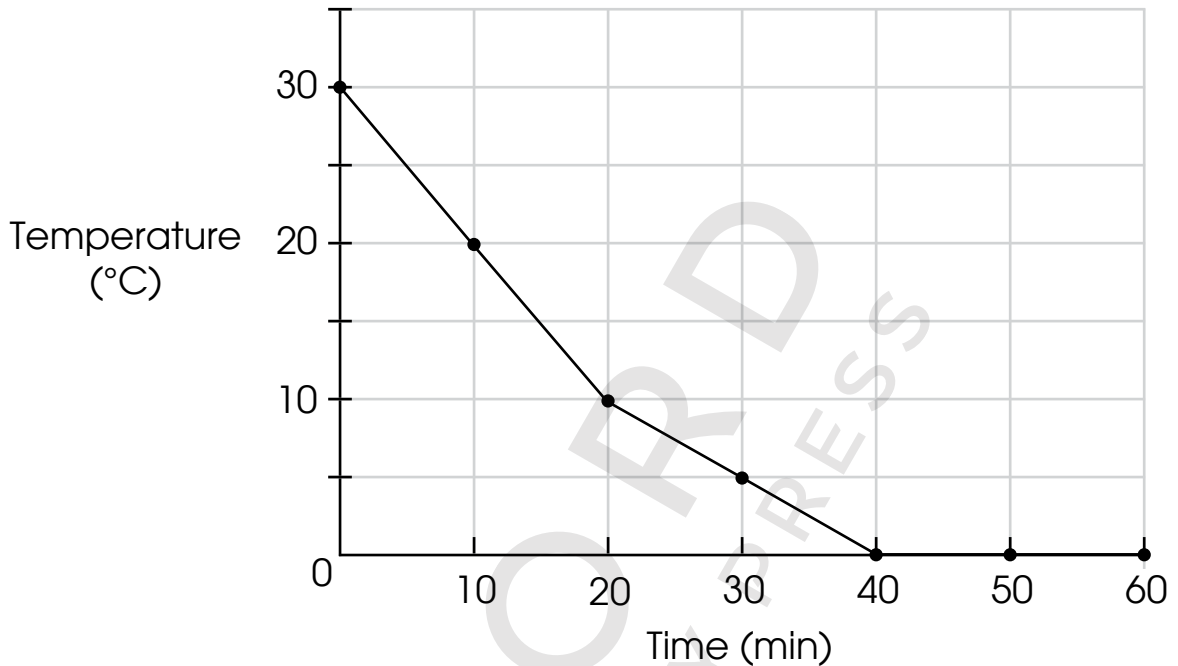
(a) Complete the table.

Time (min)							
Temperature (°C)							

(b) What was the temperature of the water in the glass at the beginning? ⬜ °C

(c) How much did the temperature drop after the glass was left in the freezer for 20 minutes? ⬜ °C

(d) What do you notice about the temperature of the water after the glass had been left in the freezer for more than 40 minutes?

Did the temperature increase, decrease or remain the same?

49

5. The line graph shows the amount of rainfall from August to December in 2012.
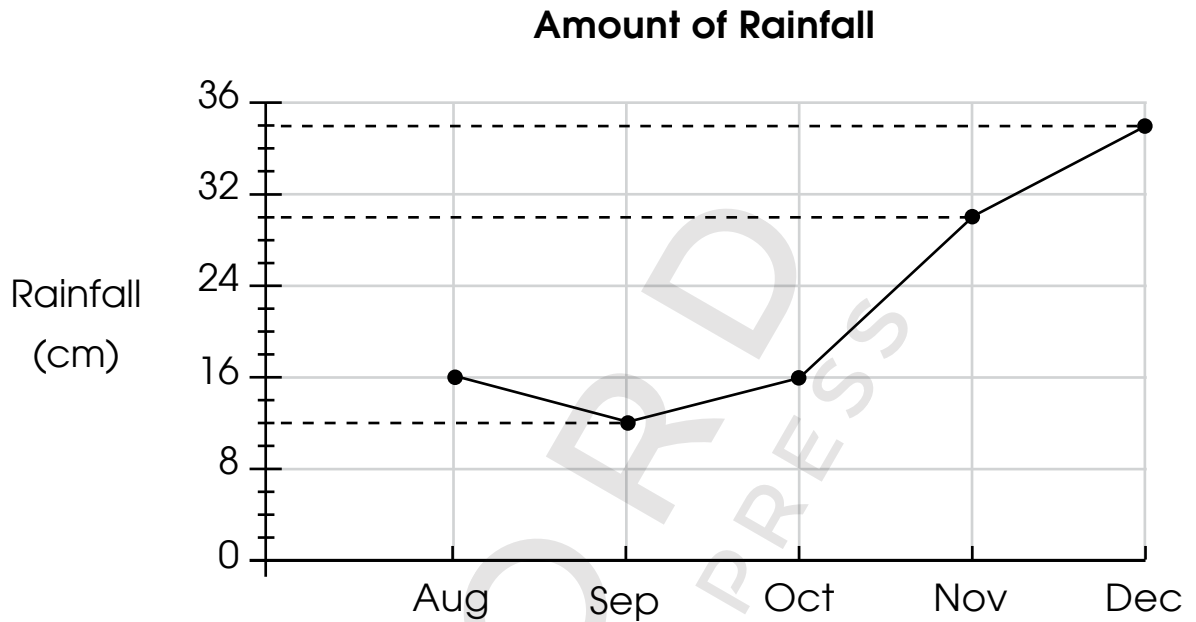
Amount of Rainfall

(a) The greatest amount of rainfall was recorded in _____ .

(b) The least amount of rainfall was recorded in _____ .

(c) The amount of rainfall recorded was the same in _____ and _____ .

(d) There was a decrease in the amount of rainfall from _____ to _____ .

(e) From September to December, there was (an increase/ a decrease) in the amount of rainfall.

6. The table shows the number of books sold at the book fair every hour.

Time	Number of Books Sold
2.00 p.m.	30
3.00 p.m.	40
4.00 p.m.	10
5.00 p.m.	20
6.00 p.m.	20

Draw a line graph that represents the data.

Number of Books Sold
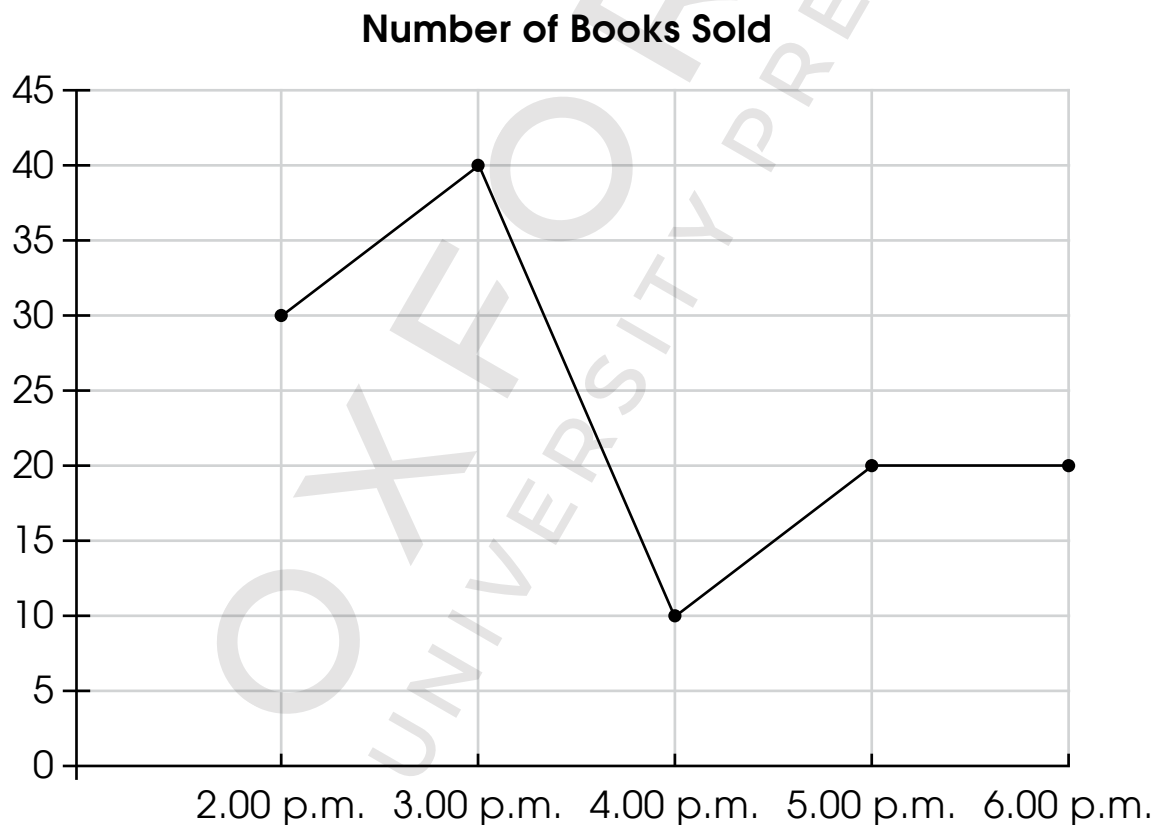
Work in groups of 4.

1 Study the table given.

Table 1   Height of five 6-year-old boys

Name	Height (cm)
Saif	121
Hassan	100
Mohsin	114
Asad	106
Saim	125

2 Go to http://www.shinglee.com.sg/StudentResources/NSPM4. Open the spreadsheet 'Tables and Line Graphs'.

3 Fill in the information given to create a bar graph and a line graph.
Which graph would you use to present the information?
Why?

4 Repeat **1** to **3**, using information in Table 2.

Table 2   Height of Waleed

Age (years)	Height (cm)
2	80
4	94
6	110
8	121
10	140

When should we use line graphs to present the information?

1. The line graph shows the monthly rainfall of a town from August to December.
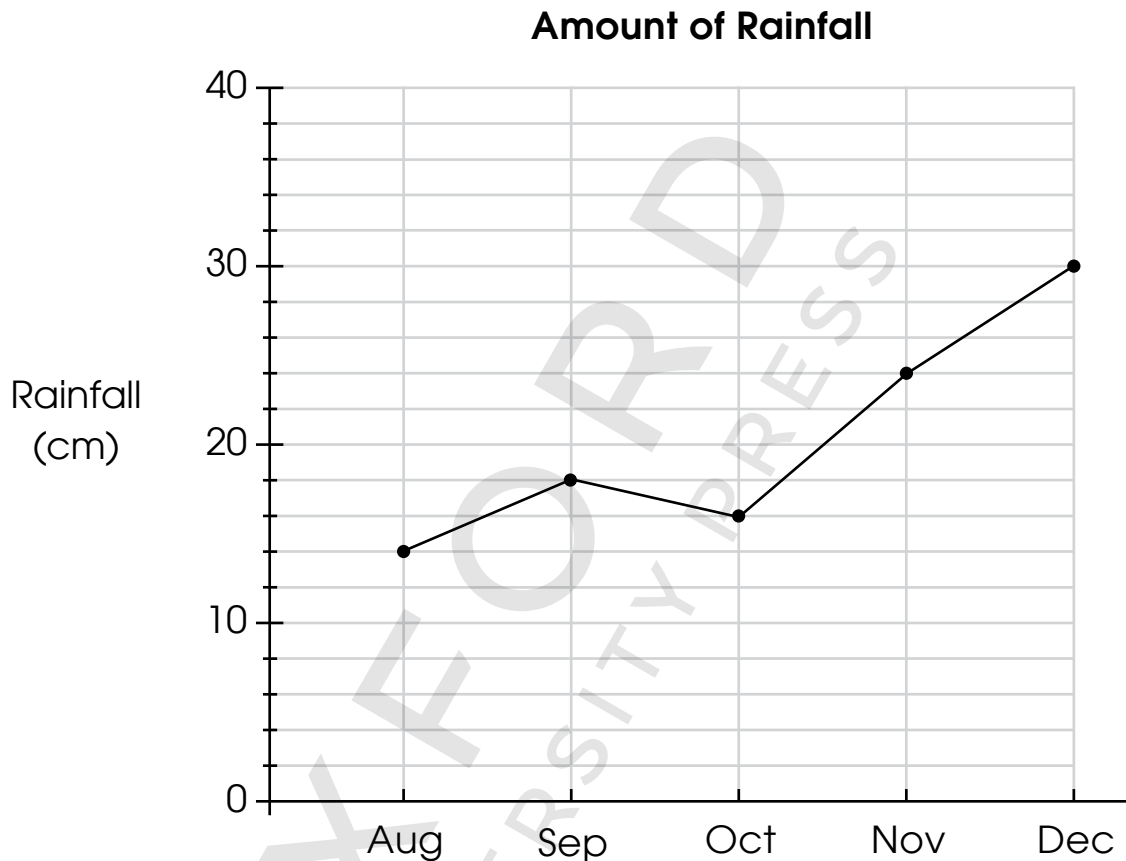
Amount of Rainfall

Study the line graph and answer the following questions.

(a) Which was the wettest month?

(b) Which was the driest month?

(c) What was the difference in the amount of rainfall between the wettest month and the driest month?   cm

(d) How much more rainfall was recorded in November than in October?   cm

2. A marathon is held once a year.
The line graph shows the number of runners in the marathon from 2010 to 2014.

Runners in the Marathon

Number of runners

5000 —
4000 —
3000 —
2000 —
1000 —
0 —

2010   2011   2012   2013   2014
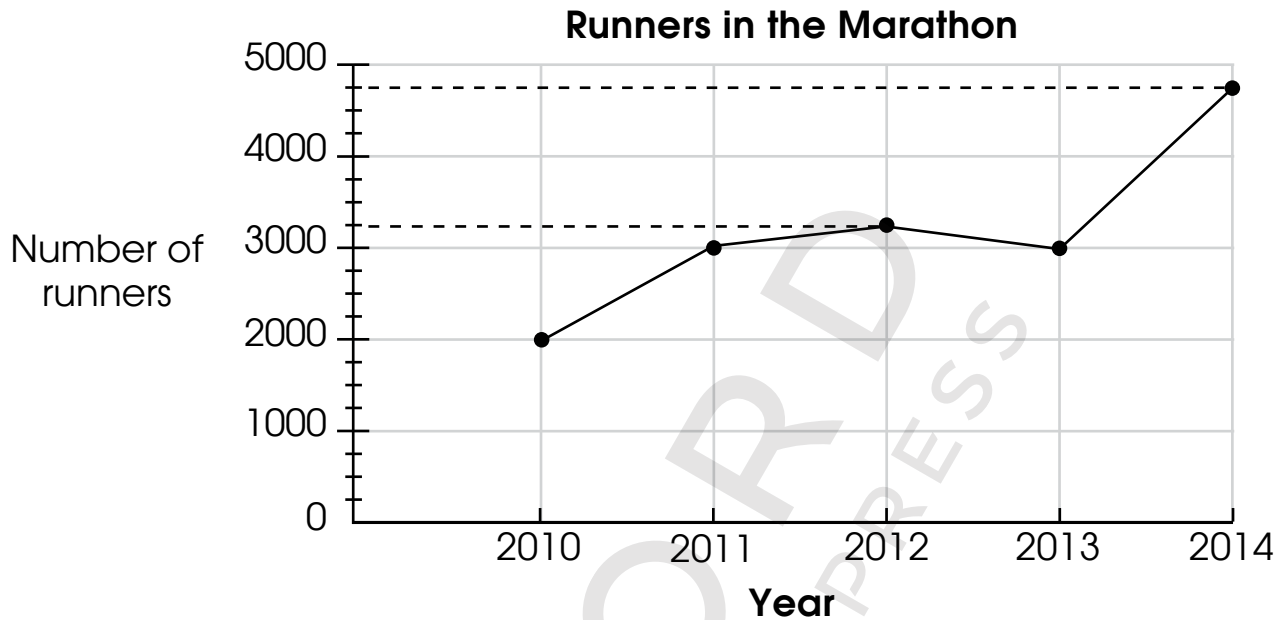
Year

(a) In which year was the number of runners twice that of the year before?

(b) The number of runners in _____ was the same as that in _____ .

(c) Between which one-year period was the increase in the number of runners the greatest? _____ and _____

(d) Describe the change in the number of runners between 2010 and 2012.

Which line represents the greatest increase?

3. The table shows the temperature in Karachi over a 12-hour period.

Time	Temperature (°C)
9.00 a.m.	20
11.00 a.m.	22
1.00 p.m.	25
3.00 p.m.	24
5.00 p.m.	22
7.00 p.m.	19
9.00 p.m.	18

Draw a line graph that represents the data.

Temperature in Karachi
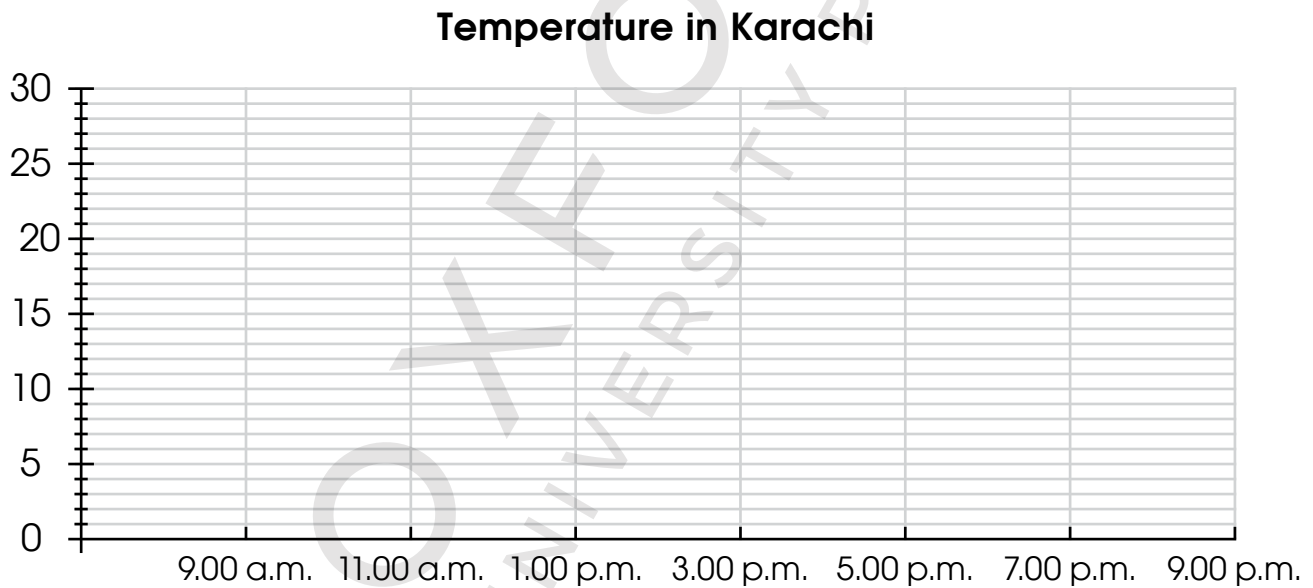
DRAWING BAR GRAPH

The table shows the number of people at a park.

Men	Women	Boys	Girls
25	40	50	15

Draw a bar graph using the information above.

People at a Park

Number of people

60
40
20
0

Men   Women   Boys   Girls

Use the bar graph to answer the questions.

(a) How many total number of people are there? _____

(b) How many males are there? _____

(c) Sara says there are 55 females at the park.

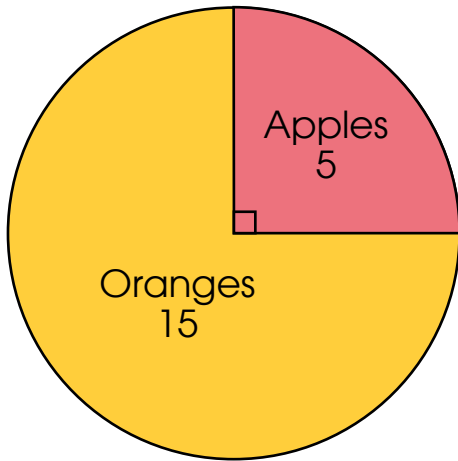Is she correct? Why?_____

(d) Adil says there are 60 children at the park.

Is he correct? Why?   ?_____

PIE CHARTS

1. We can use a **pie chart** to represent the information.

5 out of 20 fruits are apples and 15 out of 20 fruits are oranges.
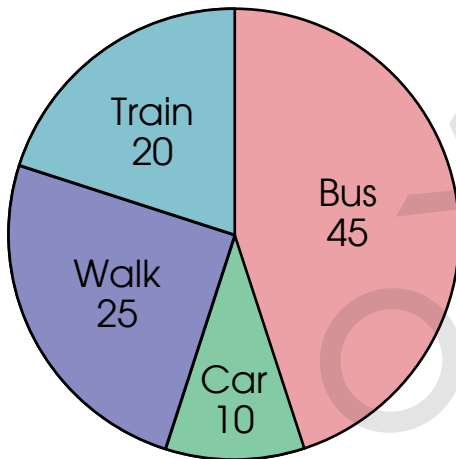
$$\frac{5}{20} = \frac{1}{4} \qquad \frac{15}{20} = \frac{3}{4}$$

So, we use $\frac{1}{4}$ of the circle to represent the number of apples and $\frac{3}{4}$ to represent the number of oranges.

The whole circle represents a whole, or 100%.

2. The pie chart shows how 100 pupils travel to school every day.

Study the pie chart and answer the questions.

(a) How many pupils walk to school?

           pupils walk to school.

(b) Which mode of transport is used by most of the pupils?
The mode of transport used by most of the pupils

is   .

How do we tell?

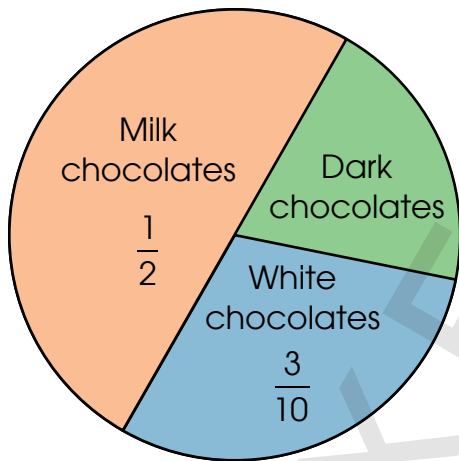(c) What fraction of the pupils travel to school by car?

$$\frac{10}{100} = \frac{\boxed{}}{\boxed{}}$$

> There are 100 pupils. 10 pupils travel to school by car.

$\frac{\boxed{}}{\boxed{}}$ of the pupils travel to school by car.

3. The pie chart represents the number of each type of chocolate in a bag.

Milk chocolates $\frac{1}{2}$

Dark chocolates

White chocolates $\frac{3}{10}$

> Half of the pie means $\frac{1}{2}$ or 50%.

Study the pie chart and answer the questions.

(a) What fraction of the chocolates are milk chocolates?

$\frac{\boxed{}}{\boxed{}}$ of the chocolates are milk chocolates.

(b) What fraction of the chocolates are dark chocolates?

Method 1

$$\frac{1}{2} - \frac{3}{10} = \frac{\boxed{}}{\boxed{}}$$

Method 2

$$1 - \frac{1}{2} - \frac{3}{10} = \frac{\boxed{}}{\boxed{}}$$

> The pie chart represents 1 whole.

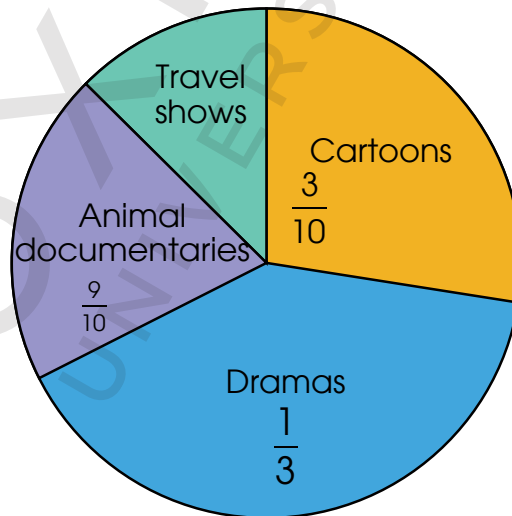$\frac{\boxed{}}{\boxed{}}$ of the chocolates are dark chocolates.

1. A survey was carried out to find out the pupils' favourite sports. The pie chart shows the results of the survey.
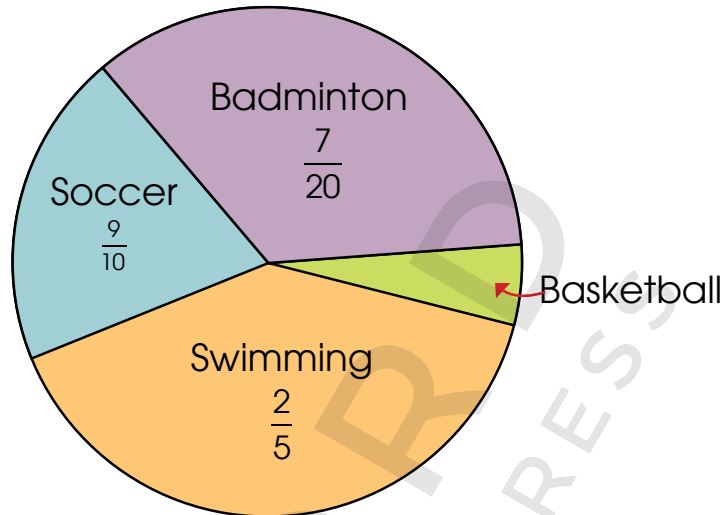
   (a) What fraction of the pupils chose basketball as their favourite sport?
   (b) Which sport was more popular, badminton or swimming?

2. The pie chart shows the different types of television programmes that 30 pupils like.

   (a) Which was more popular, dramas or animal documentaries?
   (b) What fraction of the pupils chose travel shows?
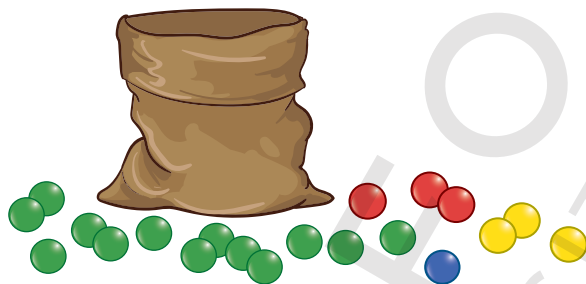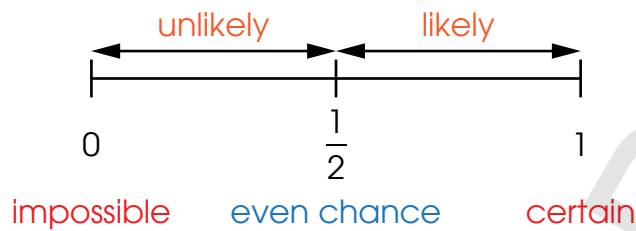
PROBABILITY

1. The chance of an event occurring is called **probability**. It is the likelihood of an outcome happening.

Probability is measured on a scale between 0 and 1.

There are 13 green marbles in the bag and there are 20 marbles altogether. The number of green marbles in the bag is the greatest.

It is **likely** that Sam will pick a green marble.

The probability of Sam picking a green marble is $\frac{13}{20}$.

It is **unlikely** that Sam will pick a blue marble.

The probability of Sam picking a blue marble is $\frac{1}{20}$.

1 out of 20 marbles is blue.

The probability of Sam picking a yellow marble is $\frac{3}{20}$.

The probability of Sam picking a red marble is $\frac{3}{20}$.

Even chance is also called a '50-50 chance'. It is equally likely for Sam to pick a yellow marble or red marble.

The probability of picking a yellow marble or a red marble is the same. There is **even chance** of picking a yellow marble or a red marble.

2. The chance of the sun rising in the morning is **certain**.
The probability is 1.

3. The chance of rolling 2 die adding up to 20 is **impossible**.
The probability is 0.

4. There are 8 chocolates and 3 candies in a bag.

(a) The [____] are more likely to be picked from the bag.

(b) The probability of picking a chocolate is $\frac{\boxed{}}{11}$.

(c) The probability of picking a candy is $\frac{\boxed{}}{11}$.

(d) The probability of picking a cookie is $\boxed{}$.

PRACTICE

1. Complete the table by writing in events with the following chances of happening. For example: 'the sun will rise from the east' is a certain event.

Chance	Event
Impossible	
Unlikely	
Even	
Likely	
Certain	

2. What is the probability of getting '6' when a die is rolled?

3. Nora tossed a coin.
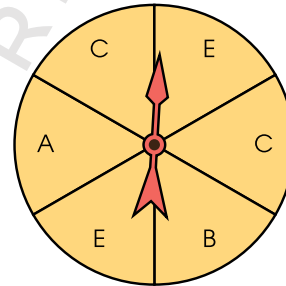What is the probability of her getting 'tails'.

4. There are 6 men, 5 women, 3 boys and 3 girls in a queue.
Find the probability of picking a child.

 MIND WORKOUT

What is the probability of the spinner not landing on E?

 MATHS JOURNAL

A box contains identical cards with alphabets that spell 'PAKISTAN'.

What is the probability of picking a card with the alphabet 'A'?

How many cards are there altogether?

How many cards have the alphabet 'A'?