SEA MATHEMATICS YEAR 2020
Section 1

1. Complete the place value chart to represent the numeral forty-five thousand, three hundred and six.

Tens of Thousands	Thousands	Hundreds	Tens	Ones
____	5	_____	_____	____

Answer:

Tens of Thousands	Thousands	Hundreds	Tens	Ones
4	**5**	**3**	**0**	**6**

2. Write a whole number in the box to make the statement true.

$$3\,100 + \boxed{} < 3\,124$$

Solution

```
  3 1 2 4
- 3 1 0 0
  ───────
      2 4
```

We choose any whole number less than 24, say, for example, 23.

$$3\,100 + \boxed{23} < 3\,124$$

Answer: $3\,100 + \boxed{23} < 3\,124$

(The number in the box could be any whole number from 0 to 23).

3. What number is represented by

$$\left(3\times100\right)+\left(7\times1\right)+\left(5\times\frac{1}{10}\right)?$$

Solution:

$$\left(3\times100\right)+\left(7\times1\right)+\left(5\times\frac{1}{10}\right)= 300+7+5\times\frac{1}{10}$$

$$=307\frac{5}{10}$$

$$=307.5$$

Answer: 307.5 or 307 ½

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4. The total value of the 5 bills shown below is $81.00. Write the missing value on the bill.

$50		$20

	$ _____	

$5		$1

Solution

$$(\$50 + \$20 + \$5 + \$1) + \$\quad = \$81$$
$$\$76 + \$\quad\quad = \$81$$
$$\$\quad\quad = \$81 - \$76 = \$5$$

Answer

$50		$20

	$ __5__	

$5		$1

By Fayad W. Ali and Shereen A. Khan.

5. Paul picked 1 725 mangoes. Estimate the number of mangoes he picked to the nearest thousand.

Solution

```
Th   h   t   u
 1   7   2   5
```
      ↑ the deciding digit is 7 and which is greater than or equal to 5

+1 _____ We add 1 to the thousands digit

```
 2   0   0   0
```

Answer: 2 000 when expressed to the nearest thousand.

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6. Jamaal baked the cookies on the tray below. He ate $\dfrac{2}{15}$ of the cookies.

How many cookies did he eat?

Solution

There are 6 rows of 5 cookies each
The number of cookies on the tray $= 6 \times 5$
$$= 30$$

The number of cookies eaten $= \dfrac{2}{15} \times 30$
$$= 4$$

Answer: 4 cookies

By Fayad W. Ali and Shereen A. Khan.

7. Ariana spent $\dfrac{2}{3}$ of her allowance and had \$10.00 remaining.

How much was her allowance?

Solution

Fraction of allowance remaining after spending $\dfrac{2}{3}$ $= 1 - \dfrac{2}{3} = \dfrac{1}{3}$

Ariana's whole allowance divided into thirds.
She remained with \$10.
So, one third of Ariana's allowance = \$10
One whole is made up of 3 thirds.
Her whole allowance = \$10 × 3
$\qquad\qquad\qquad = \$30$

Spent $\frac{2}{3}$		Remaining $\frac{1}{3}$
		\$10
\$10	\$10	\$10

Answer: \$30

---

8. $6 - \dfrac{4}{7} =$

Solution

$$6 - \dfrac{4}{7} = 5 + 1 - \dfrac{4}{7}$$

$$= 5 + \dfrac{7}{7} - \dfrac{4}{7}$$

$$= 5\dfrac{3}{7}$$

Answer: $5\dfrac{3}{7}$

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9. Write the correct value in the box to complete the number sentence.

$$16 \times 11 = \{4 \times 11\} + \{\boxed{} \times 11\}$$

Solution

$16 = 4 + 12$

So, $16 \times 11 = (4 + 12) \times 11$

$\qquad\qquad\quad = (4 \times 11) + (12 \times 11)$

Hence, 12 should be placed in the box.

Answer: $16 \times 11 = \{4 \times 11\} + \{\boxed{12} \times 11\}$

By Fayad W. Ali and Shereen A. Khan.

10. Arrange the values below in ascending order.

50%, $\dfrac{3}{4}$, 0.15

Solution

Let's express all the quantities as fractions of 100.

$50\% = \dfrac{50}{100}$

$\dfrac{3}{4} = \dfrac{75}{100}$

$0.15 = \dfrac{15}{100}$

$15 < 50 < 75$

So, in ascending order these quantities will be, $\dfrac{15}{100}, \dfrac{50}{100}, \dfrac{75}{100}$.

Answer: 0.15, 50%, $\dfrac{3}{4}$

11. Write the time shown on the clock.

Solution

The time shows 40 minutes after ten o'clock which is 20 minutes before the next hour. This can be written as 20 minutes to 11 o'clock or 10:40.

Answer: 10:40 OR 20 minutes to 11 o'clock

By Fayad W. Ali and Shereen A. Khan.

12. An incomplete calendar is given below.

NOVEMBER						
Sun	Mon	Tues	Wed	Thur	Fri	Sat
			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						

What day of the week is the 30th of November?

Solution
We complete the calendar for the month of November.

NOVEMBER						
Sun	Mon	Tues	Wed	Thur	Fri	Sat
			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**		

The 30th of November is a Thursday.
Answer: Thursday

13. Priya drank 5 boxes of the orange juice shown below.
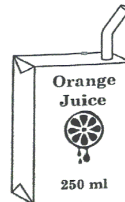
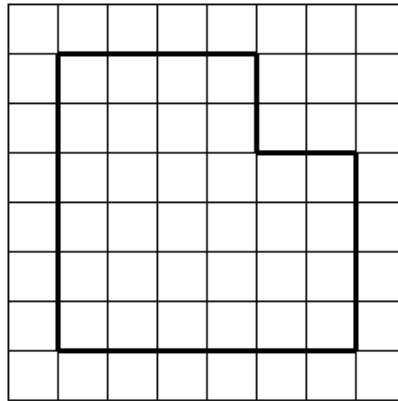How many litres of orange juice did she drink?

Solution
The total volume of orange juice Priya drank $= 250 \text{ ml} \times 5$
$$= 1\,250 \text{ ml}$$

$1\,000 \text{ ml} = 1 \text{ litre}$

The number of litres that Priya drank $= \dfrac{1\,250}{1000}$

$$= 1.25 \text{ or } 1\frac{1}{4} \quad \text{litres}$$

Answer: 1.25 litres

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14. The shape below is drawn on a 1 cm grid.

Calculate the perimeter of the shape.

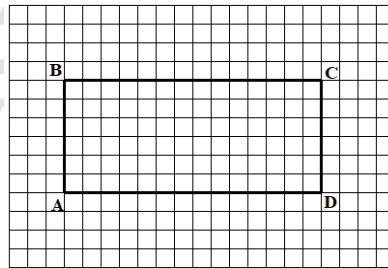**Solution**
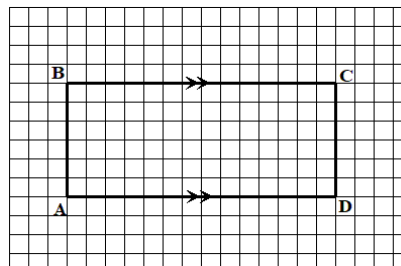Starting from the top left of the figure, we count the number of units along each side.

Perimeter $= (4+2+2+4+6+6)$ cm

$\quad\quad\quad\quad = 24$ cm

Answer: 24 cm

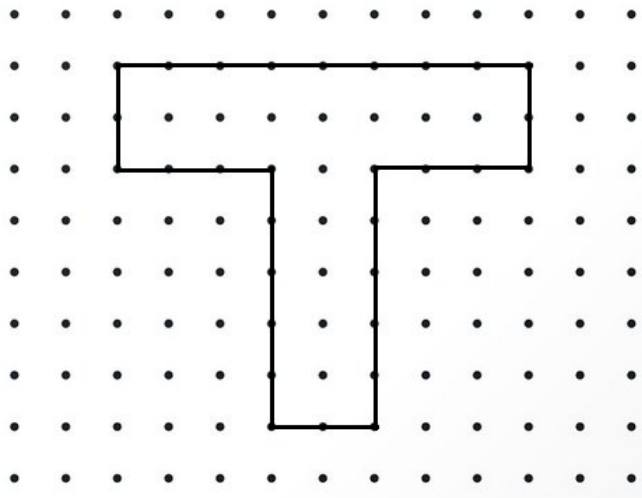**15.** In rectangle ABCD shown below, which side is parallel to AD?

Solution

The opposite sides of a rectangle are parallel to each other.
So, BC is parallel to AD and these sides are marked with arrows.
Answer: BC
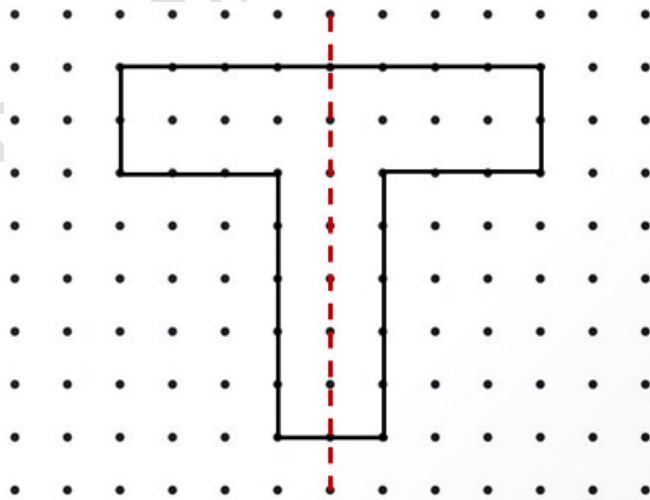
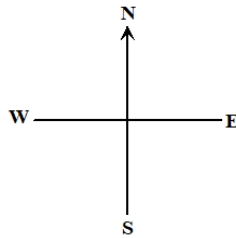**16.** Draw the line of symmetry on the shape below.

Solution:

The figure has one line of symmetry.

The line of symmetry is the vertical line shown, dotted in red.

Answer

.
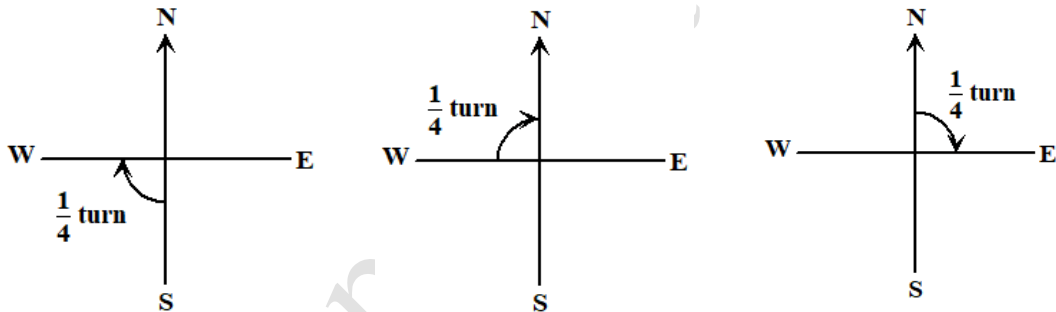
By Fayad W. Ali and Shereen A. Khan.

17. Peter was standing facing South. He turned in a clockwise direction and is now facing East.

How many quarter turns did Peter make?

Solution

From South to West is $\frac{1}{4}$ of a turn clockwise, from West to North is $\frac{1}{4}$ of a turn clockwise, and from North to East is $\frac{1}{4}$ of a turn clockwise. In all, he made 3 quarter turns in a clockwise direction.

Answer: 3 quarters of a turn

18. The shoe sizes of 15 students are shown below.

2	3	3	3	3
4	4	4	4	4
5	5	5	6	6

Which shoe size represents the mode?
Solution

Size	Number
2	1
3	4
4	5
5	3
6	2

The size that occurs the most often is size 4.
Answer: 4

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19. Sue-Ann scored the runs shown below during a cricket tournament.

24, 122, 0, 78

What was her mean score?

Solution

To find the mean score we total the scores and divide by the number of scores.

$$\text{Mean score} = \frac{24 + 122 + 0 + 78}{4}$$
$$= \frac{224}{4}$$
$$= 56$$

Answer: 56 runs

20. The incomplete tally chart below shows the 4 houses to which students belong.

House	Tally	Number
Poui	||||	4
Rose	|||	3
Hibiscus	|	1
Lily		6

Complete the tally chart to show the number of students in Lily house.

Solution:

House	Tally	Number
Poui	||||	4
Rose	|||	3
Hibiscus	|	1
Lily	⦀⦀⧄ |	6

By Fayad W. Ali and Shereen A. Khan.

21. Express $\dfrac{12}{22} \times \dfrac{11}{15}$ in its lowest form.

Solution

$$\dfrac{{}^{4}\cancel{12}}{{}_{2}\cancel{22}} \times \dfrac{\cancel{11}^{1}}{\cancel{15}_{5}} = \dfrac{4 \times 1}{2 \times 5}$$

$$= \dfrac{4}{10}$$

Answer: $\dfrac{2}{5}$ in its lowest terms

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22. Write the correct value in the box to complete the number sentence.
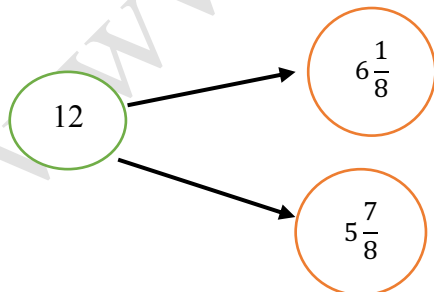
$$6 + \dfrac{1}{8} = 12 - \boxed{}$$

Solution

$$6 + \dfrac{1}{8} = 6\dfrac{1}{8}$$

$$6\dfrac{1}{8} = 12 - \boxed{}$$

$12 - 5\dfrac{7}{8} = 6\dfrac{1}{8}$, the number is $5\dfrac{7}{8}$.

OR

We can think of 12 as comprising two parts. If one part is $6\dfrac{1}{8}$, the other part is

$$12 - 6\dfrac{1}{8} = 5\dfrac{7}{8}$$

$$12 - 5\dfrac{7}{8} = 6\dfrac{1}{8}$$

Answer: $6 + \dfrac{1}{8} = 12 - \boxed{5\dfrac{7}{8}}$

23. Angie, Keisha and Chen shared 125 stickers among themselves. Keisha and Chen received an equal number of stickers and Angie received one less sticker. How many stickers did Keisha receive?

Solution
Using the method of 'try and adjust', we consider multiples of 3 near to 125, say 126

$$3\overline{)126}$$
$$\quad\ 42$$

Now adjust the numbers to add to 125
Keisha received 42 stickers.
Chen received 42 stickers.
Angie received $42-1=41$ stickers

OR
We can also consider 124

$$3\overline{)124}$$
$$\quad\ 41$$

Now adjust the numbers to add to 125
Angie received 41 stickers.
Keisha and Chen would each receive $41+1=42$ stickers.

OR Using an algebraic equation

Keisha $\quad x$
Chen $\qquad x$
Angie $\quad \underline{x-1}$
$\qquad\quad 3x-1$

So, $3x-1=125$
$\qquad 3x=126$
$\qquad\ x=42$

OR Using a diagram

Keisha	1

Chen	1

Angie	

The total in all the boxes is 125, but there are 3 equal shares plus an extra 2 stickers. If we take away the two extra stickers then this leaves 123 stickers.

$$123 \div 3 = 41$$

So, Angie has 41 stickers. Keisha has 42 stickers and Chen has 42 stickers.

Answer: Keisha received 42 stickers

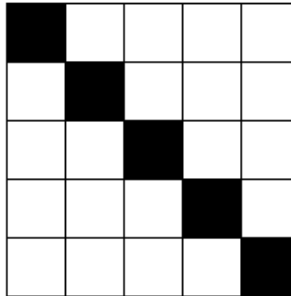**24.** What is the sum of the five **smallest prime** numbers?

Solution

The five smallest prime numbers are 2, 3, 5, 7, 11.

$2 + 3 + 5 + 7 + 11 = 28$

Answer: 28

25. On the grid shown below, 5 squares are shaded.

How many more squares must be shaded for 60% of the grid to be shaded?

Solution

The grid has $5 \times 5 = 25$ squares.
The number of squares to be shaded is:

60% of $25 = \dfrac{60}{100} \times 25$

$\qquad\qquad\quad = 15$

So, 15 squares must be shaded.

5 squares are already shaded.

So, to have 60% shaded squares we need to shade $15 - 5 = 10$ more.

Answer: 10 squares

By Fayad W. Ali and Shereen A. Khan.

26. Greg spent $\frac{1}{3}$ of his allowance and loaned $\frac{1}{2}$ of the remaining money to his friend. He now has $20.00 remaining. How much money did Greg have a first?

Solution

Fraction spent from allowance $= \frac{1}{3}$

Remaining fraction after spending $= 1 - \frac{1}{3} = \frac{2}{3}$

Fraction loaned to a friend $= \frac{1}{2} \times \frac{2}{3} = \frac{1}{3}$

Fraction of Greg's allowance that was spent and loaned $= \frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

So, the fraction he now has remaining $= 1 - \frac{2}{3} = \frac{1}{3}$

But Greg has $20 remaining.

Therefore, one third $\left(\frac{1}{3}\right)$ of Greg's allowance = $20

Greg's total allowance = $20×3

$\qquad\qquad\qquad\quad$ = $60

OR

We can represent Greg's allowance using a rectangle. He spent one third.

Spent $\frac{1}{3}$	Remaining after spending $\frac{2}{3}$

The remaining allowance is two thirds.
He loaned half of the two thirds to a friend. Half of two thirds is one third.
So, he loaned his friend one third.

Spent $\frac{1}{3}$	Loaned $\frac{1}{3}$	Remaining after loaning friend $\frac{1}{3}$

After loaning one third to his friend, he remained with $20. So, one third of his allowance is $20. The whole allowance = $20 + $20 + $20 = $60

$20	$20	$20

Answer: $60

By Fayad W. Ali and Shereen A. Khan.

27. Insert the possible values of the missing digits to complete the operation.

$$
\begin{array}{ccccc}
 & 3 & \boxed{} & 2 & \boxed{} \\
+ & & \boxed{} & 1 & 8 \\
\hline
 & 4 & 5 & 3 & 8 \\
\hline
\end{array}
$$

Solution

The ones digit: $8 + \boxed{0} = 8$

The hundreds digit must comprise two digits that add to 15. This is because the thousands digit is 4 and so the hundreds sum to 15.
15 hundreds = 1 thousand + 5 hundreds.

$$
\begin{array}{ccccc}
\text{TH} & \text{H} & \text{T} & \text{O} \\
3 & \boxed{6} & 2 & \boxed{0} \\
+ & \boxed{9} & 1 & 8 \\
\hline
4 & 5 & 3 & 8 \\
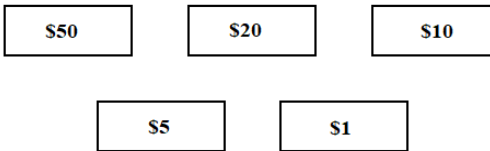\end{array}
$$

$3 + 1 = 4 \quad 6 + 9 = 15 \quad 2 + 1 = 3 \quad 8 + 0 = 8$

We could also have used 7 and 8 instead of 6 and 9.
Also, we could have interchanged the position of the digits.

Answer:

$$
\begin{array}{ccccc}
3 & \boxed{6} & 2 & \boxed{0} \\
+ & \boxed{9} & 1 & 8 \\
\hline
4 & 5 & 3 & 8 \\
\hline
\end{array}
\quad \text{OR} \quad
\begin{array}{ccccc}
3 & \boxed{7} & 2 & \boxed{0} \\
+ & \boxed{8} & 1 & 8 \\
\hline
4 & 5 & 3 & 8 \\
\hline
\end{array}
$$

28. Andra needs to pay 2 sums of money, $75.00 and $54.00. She can use any number of each bill shown below to the pay the exact amounts.

$50 $20 $10

$5 $1

Which of the 2 sums of money can be paid using the fewer number of bills? Explain your answer.

Solution

To pay $75 Andra may use
$\left.\begin{array}{l} \$50 \times 1 \\ \$20 \times 1 \\ \$ \ 5 \times 1 \end{array}\right\}$ Total 3 bills

To pay $54 Andra may use
$\left.\begin{array}{l} \$50 \times 1 \\ \$ \ 1 \times 4 \end{array}\right\}$ Total 5 bills

Answer: So, Andra can pay $75 by using only 3 bills.

29. Each week, Imran read 3 books and Shiva read two more books than Imran. They read 96 books altogether during the same number of weeks.
For how many weeks did they read?

Solution

In one week, Imran reads 3 books.
In one week, Shiva reads $3 + 2 = 5$ books.
So, together they read $3 + 5 = 8$ books per week.

If they read 96 books in total, then the number of weeks that they read will be
$96 \div 8 = 12$

Answer: 12 weeks

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30. Twenty per cent of Kyra's savings is equal to 10% of Selena's savings.
What fraction of their total savings belongs to Kyra?

Solution

20% of Kyra' savings is the same value as 10% of Selena's savings.
Showing this using two separate wholes, we have:
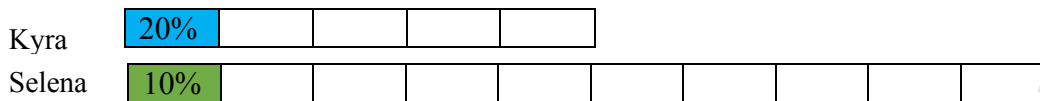
The total savings can be represented by 15 equal parts, with Kyra having 5 out of 15.
Hence, Kyra has $\frac{5}{15} = \frac{1}{3}$ of the total savings.

OR

If 20% of Kyra's savings is 10% of Selena's savings, then of their total savings,

Selena's part is $\frac{20}{10} = 2$ times as much.

So, the fraction that belongs to Kyra in their total savings is $\frac{1}{3}$.

Answer: $\frac{1}{3}$

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31. Debra fell asleep at 9:30 p.m. She slept for 4 hours and 45 minutes.
What time did she wake?

Solution

From 9:30 p.m. to 12:00 midnight, she would have slept for a period of 2 hours and 30 minutes. But she slept for 4 hours and 45 minutes in all, so, after midnight she would have slept for the remaining 2 hours and 15 minutes.

Hours	Minutes
4	45
– 2	30
2	15

She awoke 2 hours 15 minutes after midnight or 2:15 a.m.

Answer: 2:15 a.m.

OR We could have added the 4 h 45 minutes to 9:30 as shown

Hours	Minutes
1	
9	30
+ 4	45
14	15

75 minutes = 1 hour and 15 minutes

We can interpret 14:15 as 2 hours and 15 minutes past 12:00 midnight or 2:15 a.m.

32. The compound shape below is made up of a square and a rectangle. The length of the rectangle is 3 times its width.

Calculate the area of the compound shape.

Solution
The length of the square $= 4$ cm

The length of the rectangle is 3 times the width $= 4 \times 3 = 12$ cm
The length of the compound shape $= (4 + 12)$ cm $= 16$ cm
Hence, the area of the compound shape is $= 4cm \times 16cm = 64$ cm^2

Answer: 64 cm^2

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33. Tom's two suitcases had masses of 13.05 kg and 29 kg 600 g. The total mass allowed was 41.5 kg.
By how many kilograms were Tom's suitcases **over** the mass allowed?

Solution
1 kg =1000 g
Mass of first suitcase $= 13.05$ kg $= 13$ kg $+ 0.05 \times 1000$ g
                                         $= 13$ kg   50 g

Kg	g
13	50
+ 29	600
42	650

 Mass of second suitcase $= 29$ kg 600 g

Total mass of the two suitcases $= 42$ kg   650 g

Allowable mass was 41.5 Kg $= 41$ kg 500 g

Total mass – Allowable mass $= 42$ kg 650 g $- 41$ kg 500 g

Kg	g
42	650
− 41	500
1	150

                                         $= 1$ kg 150 g
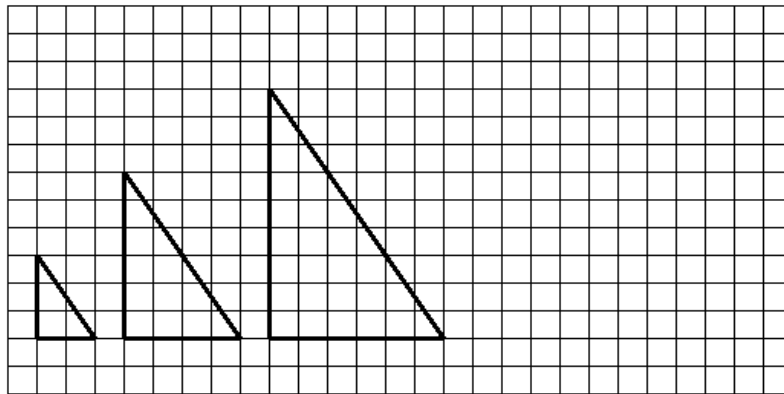
The total mass exceeds the allowable mass by 1 kg 150 g

Tom is over the allowable mass by 1 kg 150 g $= 1.15$ kg

Answer: 1.15 kg

By Fayad W. Ali and Shereen A. Khan.

34. Allan had a wooden block in the shape of a cuboid. The block measured 20 cm in length, 15 cm in width and 6 cm in height. He cut out a small cuboid of length 20 cm, width 3 cm and height 4 cm.

What was the volume of the remaining block?

Solution

Volume of the uncut block $= 6 \times 15 \times 20$ cm^3
$$= 1\,800 \text{ cm}^3$$

Volume of the portion cut $= 3 \times 20 \times 4$ cm^3
$$= 240 \text{ cm}^3$$

Hence, volume of the remaining block $=$
$$\begin{array}{r} 1\ 8\ 0\ 0 \\ -\ \ \ 2\ 4\ 0 \\ \hline 1\ 5\ 6\ 0 \text{ cm}^3 \end{array}$$

Answer: 1 560 cm^3

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35. The triangles shown on the grid below form a pattern.

Describe the pattern rule.

Solution

To determine the pattern, we record the dimensions of the triangle and observe the changes.

Triangle	Base in units	Height in units
1	2	3
2	4	6
3	6	9

Answer

The base increases by multiples of 2 and height increases by multiples of 3

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36. A rhombus is folded along a line of symmetry to form two identical plane shapes. State two properties of the plane shape formed.
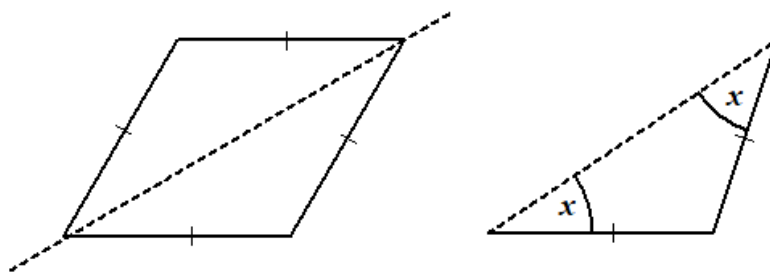
Solution

The plane shapes formed are two identical isosceles triangles.

Answer:

Two sides of the triangle are equal.

The angles at the base of each triangle are equal.

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37. Complete the shape shown below on the grid below using AB as the line of symmetry.
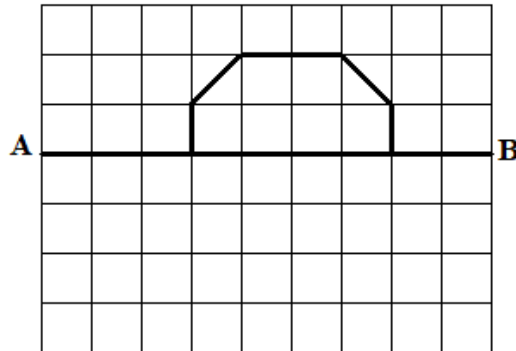
How many lines of symmetry are there in the new shape?

Solution
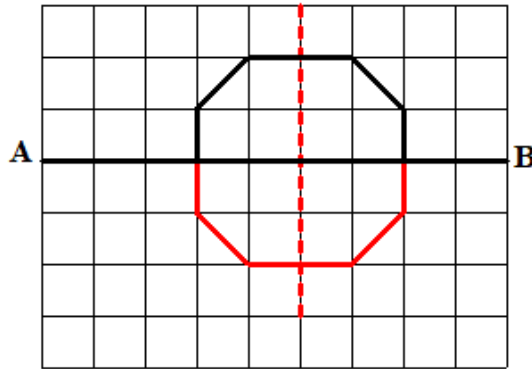
Answer: There are 2 lines of symmetry. (i) the horizontal line, AB and (ii) the vertical dotted line shown.

38. The mean of 6 numbers was 7. Another number was added and the new mean was 9. What number was added?

Solution
The mean of 6 numbers was 7.
Hence, the total of these six numbers was $7 \times 6 = 42$

The new mean of the 7 numbers is 9.
Hence, the new total is $7 \times 9 = 63$.

So, the number added was $63 - 42 = 21$

Answer: 21

39. The table below shows Vishal's scores in 4 of the 5 subjects for which he wrote tests.

Subject	Score
Mathematics	72
Spelling	14 less than Mathematics
Creative Writing	70
Science	5 more than Creative Writing
Social Studies	

The mean score in the 5 subjects was 68. What was Vishal's score in Social Studies?

Score in Mathematics   =   7 2

Score in Spelling is $72-14=$ 5 8   +

Score in Creating Writing   =   7 0

Score in Science is 70+5   =   7 5

                      Total = 2 7 5

Mean scores in the 5 subjects is 68.
So, the total score in 5 subjects is $68 \times 5 = 340$

 Score in Social Studies   =   3 4 0 $-$

                           2 7 5

                             6 5

Answer: 65

40. The bar chart below shows the number of days students were absent during a term.

Days Students were Absent
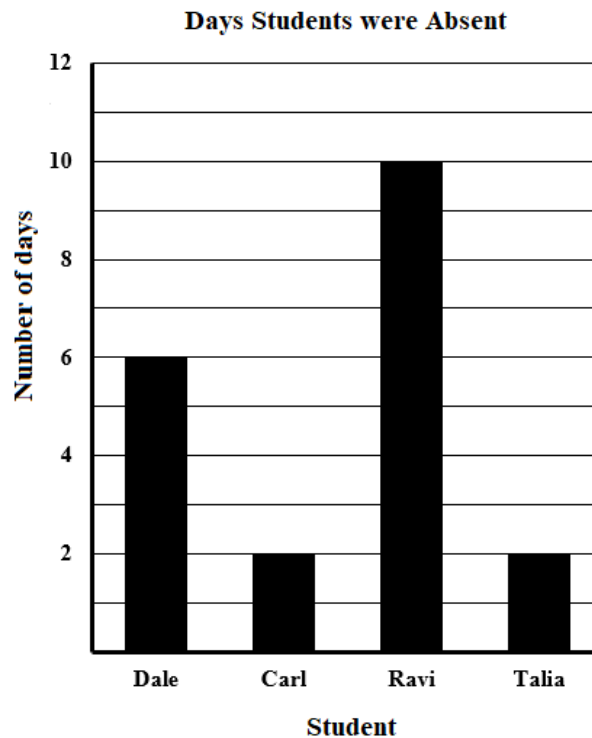
Calculate the difference between the mean number of days absent and the modal number of days absent.

Solution

Number of days absent $= 6 + 2 + 10 + 2$
$$= 20$$
Mean number of days absent $= 20 \div 4 = 5$

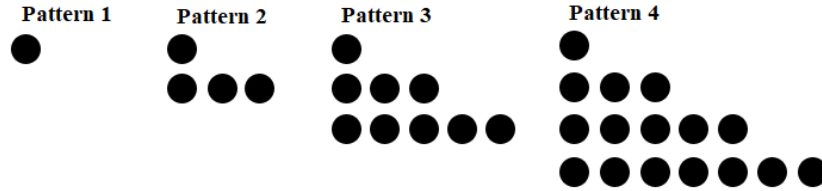To determine the mode, we list the set of scores: 6, 2, 10, 2.

The modal number of days absent $= 2$ since this is the score that occurred the most often.

Difference between mode and mean $= 5 - 2 = 3$
$$= 3$$

Answer: 3 days

By Fayad W. Ali and Shereen A. Khan.

41. Identical counters are used to form patterns in a sequence. The first four patterns are shown below.

a) Determine the number of counters that will form the **fifth** pattern in the sequence.

Solution

Pattern Number	1	2	3	4	5
Number of Dots	1	1+3	1+3+5	1+3+5+7	1+3+5+7+9

Hence, pattern 5 will have $1+3+5+7+9 = 25$ counters.

Answer: 25 counters

b) Draw the **fifth** pattern in the sequence.
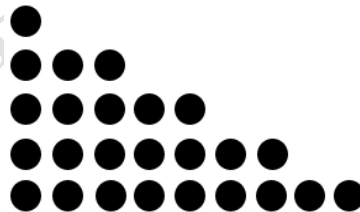
Solution

c) Malika said that the number of counters in each pattern is composite. Explain why she is **incorrect**.

Solution
A composite number is a number that has at least one other factor besides itself and one, that is, it has more than two factors.
The numbers of counters in the patterns are 1, 4, 9, 16 and 25.
The numbers 4, 9, 16 and 25 have factors besides 1 and itself and are therefore composite numbers. For example, 4 has 1, 2 and 4 as factors. The number, 1 is not a composite since it has only one factor, itself.
Since the numbers are NOT all composite, Malaika's answer is incorrect.

By Fayad W. Ali and Shereen A. Khan.

42. There were 450 spectators at a cricket match. Of these, $\frac{1}{5}$ were adults (men and women) and the others were children (boys and girls).

There were twice as many boys as girls.
The number of men was equal to half the number of girls.
How many women were at the cricket match?

Solution

The number of adults $= \frac{1}{5}(450)$
$\qquad\qquad\qquad\quad = 90$

Number of children $= 450 - 90 = 360$

So, 360 are boys and girls, but there are twice as many boys as girls.

Boys	Boys	Girls

If we divide 360 into 3 equal parts or thirds. Then each part will have 120 .

Boys 120	Boys 120	Girls 120

Hence, the number of girls is 120.

The number of men $= \frac{1}{2} \times$ number of girls

The number of men $= \frac{1}{2}(120)$
$\qquad\qquad\qquad\quad = 60$

So, the number of women $= 90 - 60$
$\qquad\qquad\qquad\qquad\quad = 30$

Answer: 30 women

By Fayad W. Ali and Shereen A. Khan.

43. A box contains small solid cubes of side 2 cm stacked along 3 edges, as shown below.
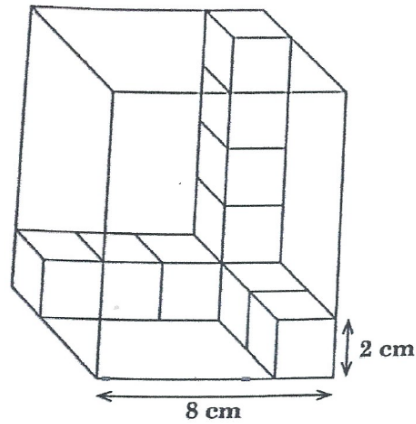
What volume of the box remains to be filled with cubes?

Solution

Height of box $= 2cm \times 5 = 10cm$

Width of box $= 2cm \times 3 = 6cm$

Length of box $= 8\ cm$

Volume of the unfilled box $= 8cm \times 6cm \times 10cm$
$$= 480\ cm^3$$

Number of cubes in the box $= 2 + 3 + +4 +1 = 10$

Volume of one cube $= 2cm \times 2cm \times 2cm = 8\ cm^3$
Volume of the 10 cubes $= 8cm^3 \times 10$
$$= 80\ cm^3$$

Hence, the cubes in the box occupies a volume of 80 cm^3
The unfilled box has a volume of 480 cm^3

Volume of box remaining to be filled $= (480 - 80)\ cm^3$
$$= 400\ cm^3$$

Answer: 400 cm^3

44. The solid building block shown below has a uniform cross-section with 2 identical cut-outs. The cut-outs are cuboids, perpendicular to the base of the building block.
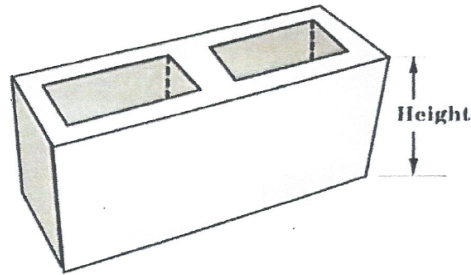
a) Complete the table below.
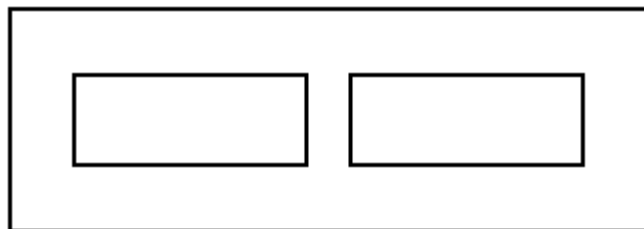
Building Block	
Number of Edges	**Number of Vertices**

Solution:

| Building Block	
Number of Edges	**Number of Vertices**
$12+12+12=36$	$8+8+8=24$

b) Draw the cross-section of the building block to its base.

Answer:

Note: A block such as this has **inner** and **outer** surfaces. As a result, it has additional **inner edges** (24) and **inner vertices (16)**. Since this type of solid is not common when studying properties of 3D shapes, students should be guided as to what should be included when counting the edges and vertices in this problem.

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By Fayad W. Ali and Shereen A. Khan.

45. Three groups are made using numbers 1 to 9. Group 1 has the same mode as Group 3. Group 2 has the same mean as Group 3. The modal value occurs at least 3 times in Group 3.
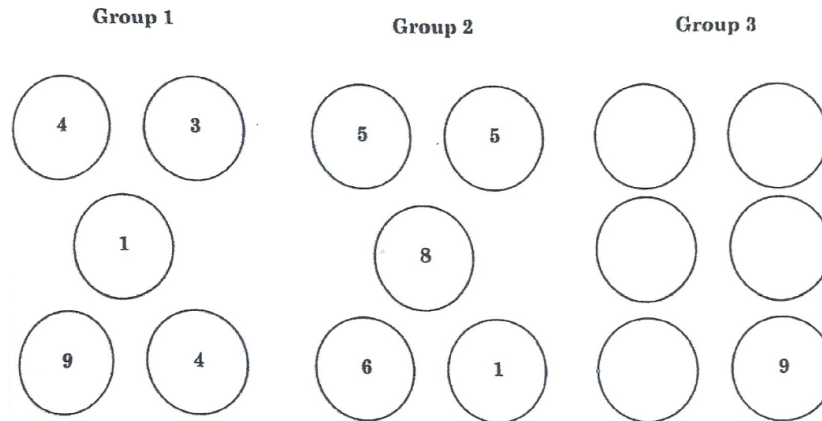
Write the missing numbers in the circles in Group 3 to show **one** possible solution.
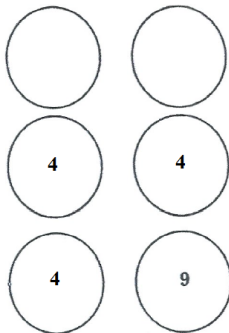
Solution

Mode of Group 1 is 4 since the score of 4 occurred more than any other score.

Mean of Group 2 is $\dfrac{5+5+8+6+1}{5} = \dfrac{25}{5}$
$= 5$

So, the mean of Group 3 is 5.

Since 4 occurs at least three times, the incomplete group 3 so far is

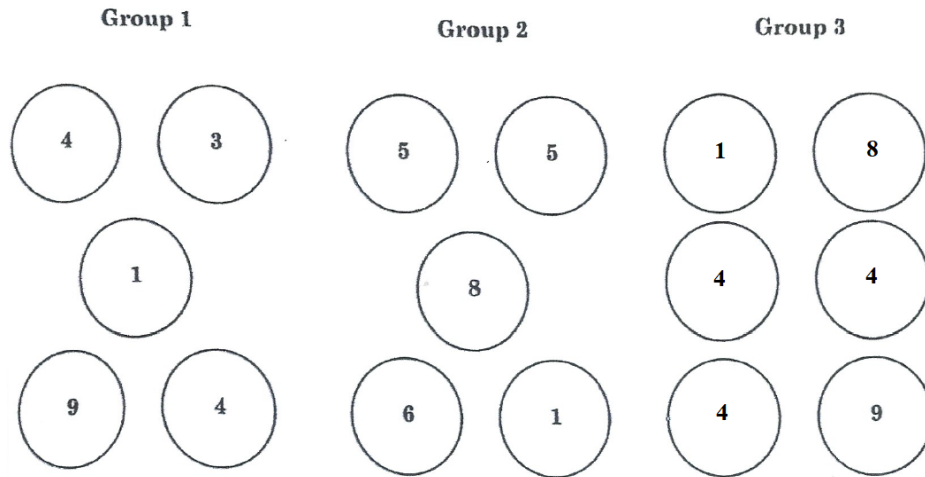

The total of 4 of the numbers is $4+4+4+9 = 21$
Group 3 has a mean of 5 (since it has the same mean as Group 2).
So, the total of the 6 numbers in Group 3 $= 6 \times 5 = 30$

Therefore, the sum of the two remaining numbers in Group 3 is $30 - 21 = 9$
The missing two numbers can be 1 and 8 OR 2 and 7 OR 3 and 6 OR 4 and 5.

Answer:

Group 1

Group 2

Group 3

Our answer only shows 1 and 8 and which is one of these four possibilities.

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK BEFORE HANDING IN YOUR PAPER.