Chapter 3: A Peek Beyond The Point

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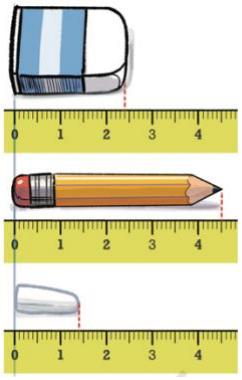
Q. Which scale helped you measure the length of the screws accurately? Why?
Solution:
The scale with millimeter markings helped measure the length of the screws accurately because it allows for more precise and detailed measurements compared to scales with only centimeter markings.

Q. What is the meaning of $2\frac{7}{10}$ cm (the length of the first screw)?
Solution:
It means that the length of the screw is two and seven-tenth centimeters.

Q. Can you explain why the unit was divided into smaller parts to measure the screws?
Solution:
The unit was divided into smaller parts because the lengths of the screws were not whole centimetres. Smaller divisions, like millimetres, were needed to measure them more accurately.

Q. Measure the following objects using a scale and write their measurements in centimeters (as shown earlier for the lengths of the screws): pen, sharpener, and any other object of your choice.
Solution:
Pen: 14 cm
Sharpener: 3.2 cm
Eraser: 4.0 cm
Notebook: 21cm

Q. Write the measurements of the objects shown in the picture:



Answer:
Eraser: 2.4 cm
Pencil: 4.5 cm
Chalk: 1.4 cm

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Q. Arrange these lengths in increasing order:
(a) $\frac{9}{10}$ (b) $1\frac{7}{10}$ (c) $\frac{130}{10}$ (d) $13\frac{1}{10}$ (e) $10\frac{5}{10}$ (f) $7\frac{6}{10}$ (g) $6\frac{7}{10}$ (h) $\frac{4}{10}$
Solution:
(a) $\frac{9}{10} = 0.9$

(b) $1\frac{7}{10} = \frac{17}{10} = 1.7$

(c) $\frac{130}{10} = 13.0$

(d) $13\frac{1}{10} = \frac{131}{10} = 13.1$

(e) $10\frac{5}{10} = \frac{105}{10} = 10.5$

(f) $7\frac{6}{10} = \frac{76}{10} = 7.6$

(g) $6\frac{7}{10} = \frac{67}{10} = 6.7$

(h) $\frac{4}{10} = 0.4$

$0.4 < 0.9 < 1.7 < 6.7 < 7.6 < 10.5 < 13.0 < 13.1$
or $\frac{4}{10} < \frac{9}{10} < 1\frac{7}{10} < 6\frac{7}{10} < 7\frac{6}{10} < 10\frac{5}{10} < \frac{130}{10} < 13\frac{1}{10}$

Q. Arrange the following lengths in increasing order: $4\frac{1}{10}$, $\frac{4}{10}$, $\frac{41}{10}$, $41\frac{1}{10}$.
Solution:
$4\frac{1}{10} = \frac{41}{10} = 4.1$
$\frac{4}{10} = 0.4$
$\frac{41}{10} = 4.1$
$41\frac{1}{10} = \frac{411}{10} = 41.1$

$0.4 < 4.1 = 4.1 < 41.1$
or $\frac{4}{10} < 4\frac{1}{10} = \frac{41}{10} < 41\frac{1}{10}$

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Q. Sonu is measuring some of his body parts. The length of Sonu's lower arm is $2\frac{7}{10}$ units, and that of his upper arm is $3\frac{6}{10}$ units. What is the total length of his arm?

Solution:

Lower arm = $2\frac{7}{10}$ units

Upper arm = $3\frac{6}{10}$ units

Total length of arms = $2\frac{7}{10} + 3\frac{6}{10}$

$= (2 + 3) + \left(\frac{7}{10} + \frac{6}{10}\right)$

$= 5 + \frac{13}{10}$

$= 5 + \frac{10}{10} + \frac{3}{10}$

$= 5 + 1 + \frac{3}{10}$

$= 6\frac{3}{10}$ units.

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Q. The lengths of the body parts of a honeybee are given. Find its total length.

Head: $2\frac{3}{10}$ units

Thorax: $5\frac{4}{10}$ units

Abdomen: $7\frac{5}{10}$ units

Solution:

Total length of bee = Head + Thorax + Abdomen

$= 2\frac{3}{10} + 5\frac{4}{10} + 7\frac{5}{10}$

$= (2 + 5 + 7) + \left(\frac{3}{10} + \frac{4}{10} + \frac{5}{10}\right)$

$= 14 + \left(\frac{3+4+5}{10}\right)$

$= 14 + \frac{12}{10}$

$= 14 + \frac{10}{10} + \frac{2}{10}$

$= 14 + 1 + \frac{2}{10}$

$= 15\frac{2}{10}$ units.

Q. The length of Shylaja's hand is $12\frac{4}{10}$ units, and her palm is $6\frac{7}{10}$units, as shown in the picture. What is the length of the longest (middle) finger?

Solution:

Length of hand = $12\frac{4}{10}$ units

Length of palm = $6\frac{7}{10}$units

Length of longest finger = Hand – Palm

$= 12\frac{4}{10} - 6\frac{7}{10}$

$= (12 - 6) + \left(\frac{4}{10} - \frac{7}{10}\right)$

$= 6 + \frac{-3}{10}$

$= 6 - \frac{3}{10}$

$= 5 + 1 - \frac{3}{10}$

$= 5 + \frac{10}{10} - \frac{3}{10}$

$= 5 + \frac{10-3}{10} = 5 + \frac{7}{10} = 5\frac{7}{10}$ units.

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Q. Try computing the difference by converting both lengths to tenths.

Length of hand = $12\frac{4}{10}$ units

Length of palm = $6\frac{7}{10}$units

Solution:

Length of hand = $12\frac{4}{10}$ units = $\frac{124}{10}$ units

Length of palm = $6\frac{7}{10}$units = $\frac{67}{10}$ units

Length of longer finger = Hand – Palm

$= \frac{124}{10} - \frac{67}{10}$

$= \frac{124-67}{10}$

$= \frac{57}{10}$

$= \frac{50}{10} + \frac{7}{10} = 5 + \frac{7}{10} = 5\frac{7}{10}$ units.

Q. A Celestial Pearl Danio's length is $2\frac{4}{10}$ cm, and the length of a Philippine Goby is $\frac{9}{10}$ cm. What is the difference in their lengths?

Solution:

Celestial Pearl Dino's length = $2\frac{4}{10}$ cm = $\frac{24}{10}$ cm

Philippine Goby's length = $\frac{9}{10}$ cm

Difference in length = $\frac{24}{10} - \frac{9}{10}$

$= \frac{24-9}{10}$

$= \frac{15}{10}$

$= \frac{10}{10} + \frac{5}{10} = 1 + \frac{5}{10} = 1\frac{5}{10}$ cm.

Q. How big are these fish compared to your finger?

Solution:

Celestial Pearl Dino = $\frac{24}{10}$ cm = 2.4 cm

Philippine Goby = $\frac{9}{10}$ = 0.9 cm

Little finger's length = 2.7 cm

Celestial Pearl Dino is 0.3 cm (2.7 – 2.4 = 0.3 cm) smaller than my little finger.

Philippine Goby is 1.8 cm (2.7 – 0.9 = 1.8 cm) smaller than my little finger.

Q. Observe the given sequences of numbers. Identify the change after each term and extend the pattern:

(a) 4, 4 $\frac{3}{10}$, 4 $\frac{6}{10}$, …….

(b) $8\frac{2}{10}$, $8\frac{7}{10}$, $9\frac{2}{10}$, …….

(c) $7\frac{6}{10}$, $8\frac{7}{10}$, …….

(d) $5\frac{7}{10}$, $5\frac{4}{10}$, …….

(e) 13 $\frac{5}{10}$,13, 12 $\frac{5}{10}$, …….

(f) 11 $\frac{5}{10}$, 10 $\frac{4}{10}$, 9 $\frac{3}{10}$, …….

Solution:

(a) 4, 4 $\frac{3}{10}$, 4 $\frac{6}{10}$, …….

Change = Addition of $\frac{3}{10}$.

4, 4 $\frac{3}{10}$, 4 $\frac{6}{10}$, 4 $\frac{9}{10}$, $5\frac{2}{10}$, 5 $\frac{5}{10}$, ……

(b) $8\frac{2}{10}$, $8\frac{7}{10}$, $9\frac{2}{10}$, …….

Change = Addition of $\frac{5}{10}$.

$8\frac{2}{10}$, $8\frac{7}{10}$, $9\frac{2}{10}$, 9 $\frac{7}{10}$, 10 $\frac{2}{10}$, 10 $\frac{7}{10}$, ……

(c) $7\frac{6}{10}$, $8\frac{7}{10}$, …….

Change = Addition of $1\frac{1}{10}$.

$7\frac{6}{10}$, $8\frac{7}{10}$, $9\frac{8}{10}$, 10 $\frac{9}{10}$, 12, 13 $\frac{1}{10}$, …….

(d) $5\frac{7}{10}$, $5\frac{3}{10}$, ……

Change = Subtraction of $\frac{4}{10}$.

$5\frac{7}{10}$, $5\frac{3}{10}$, $4\frac{9}{10}$, $4\frac{5}{10}$, $4\frac{1}{10}$, 3 $\frac{7}{10}$, ……

(e) 13 $\frac{5}{10}$,13, 12 $\frac{5}{10}$, …….

Change = Subtraction of $\frac{5}{10}$.

$13\frac{5}{10}$, 13, $12\frac{5}{10}$, 12, $11\frac{5}{10}$, 11, $10\frac{5}{10}$, 10, ...

(f) $11\frac{5}{10}$, $10\frac{4}{10}$, 9 , ...

Change = Subtraction of $1\frac{1}{10}$.

$11\frac{5}{10}$, $10\frac{4}{10}$, $9\frac{3}{10}$, $8\frac{2}{10}$, $7\frac{1}{10}$, 6, ...

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Q. What is the length of this smaller part? How many such smaller parts make a unit length?

Solution:

Length of each smaller part on splitting each one-tenth into 10 parts = $\frac{1}{100}$.

100 such smaller parts make a unit length.

Q. How many one-hundredths make one-tenth? Can we also say that the length is 4 units and 45 one-hundredths? (Length is 4 units and 4 one-tenths and 5 one-hundredths)

Solution:

Number of one-hundredths in one-tenth = $\frac{1}{100} \div \frac{1}{10}$ = 10.

4 units and 4 one-tenths and 5 one-hundredths = $4 + \frac{4}{10} + \frac{5}{100}$ = 4 + 0.4 + 0.45 = 4.45 units.

4 units and 45 one-hundredths = $4 + \frac{45}{100}$ = 4 + 0.45 = 4.45 units.

Hence, 4 units and 4 one-tenths and 5 one-hundredths can also be written as 4 units and 45 one-hundredths.

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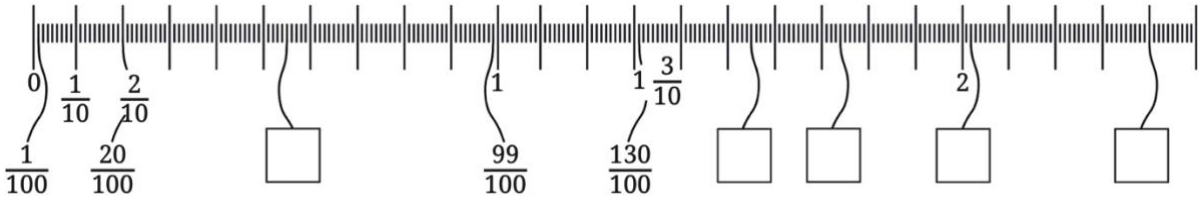
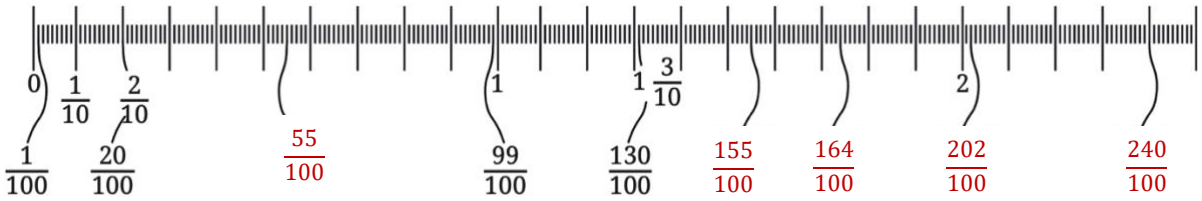
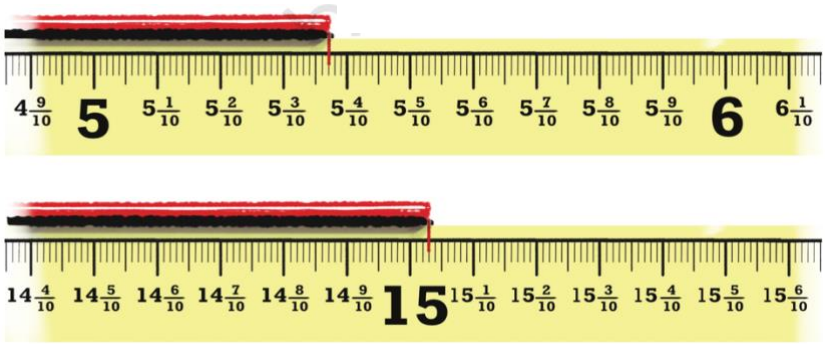
Q. Observe the figure below. Notice the markings and the corresponding lengths written in the boxes when measured from 0. Fill the lengths in the empty boxes.



Solution:



Q. For the lengths shown below write the measurements and read out the measures in words.



Solution:

$5\ \frac{3}{10}\ \frac{7}{100}$ = Five and three-tenths and seven-hundredths.

$15\ \frac{3}{100}$ = Fifteen and three-hundredths.

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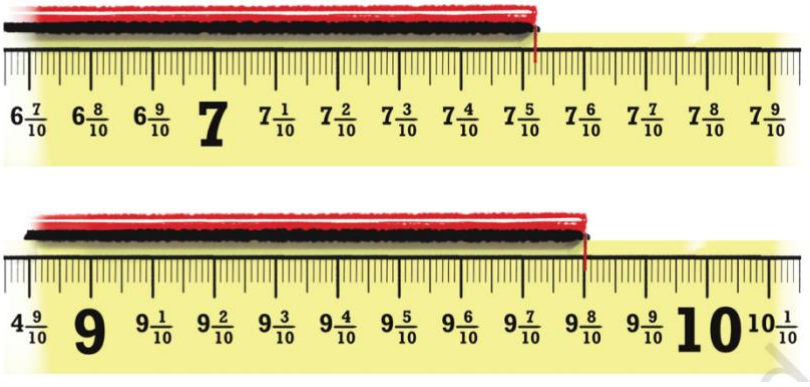
Q. For the lengths shown below write the measurements and read out the measures in words.



Solution:

$7\frac{5}{10}\frac{2}{100}$ = Seven and five-tenths and two-hundredths.

$9\frac{80}{100}$ = Nine and eighty-hundredths.

Q. In each group, identify the longest and the shortest lengths. Mark each length on the scale.

(a) $\frac{3}{10}, \frac{3}{100}, \frac{33}{100}$

(b) $3\frac{1}{10}, \frac{30}{10}, 1\frac{3}{10}$

(c) $\frac{45}{100}, \frac{54}{100}, \frac{5}{10}, \frac{4}{10}$

(d) $3\frac{6}{10}, 3\frac{6}{100}, 3\frac{6}{10}\frac{6}{100}$

(e) $\frac{8}{10}\frac{2}{100}, \frac{9}{100}, 1\frac{8}{100}$

(f) $7\frac{3}{10}\frac{5}{100}, 7\frac{5}{10}, 7\frac{41}{100}$

(g) $\frac{65}{10}\frac{15}{100}, 5\frac{87}{100}, 5\frac{7}{100}$

Solution:

(a) $\frac{3}{10}, \frac{3}{100}, \frac{33}{100}$

$\frac{3}{10} = \frac{30}{100}$; $\frac{3}{100}$; $\frac{33}{100}$

Longest length = $\frac{33}{100}$

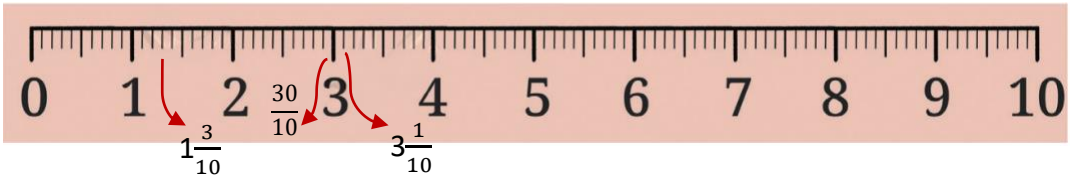
Shortest length = $\frac{3}{100}$

(b) $3\frac{1}{10}, \frac{30}{10}, 1\frac{3}{10}$

$3\frac{1}{10} = \frac{31}{10} = 3.1$; $\frac{30}{10} = 3$; $1\frac{3}{10} = \frac{13}{10} = 1.3$

Longest length = $3\frac{1}{10}$

Shortest length = $1\frac{3}{10}$

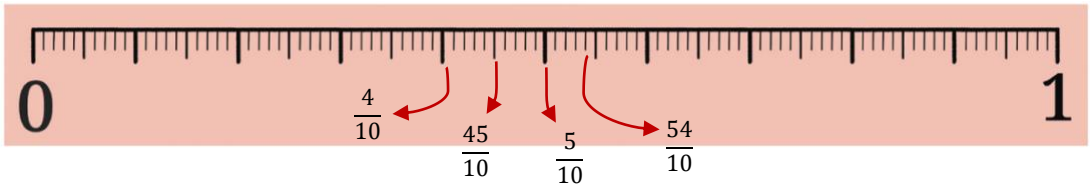


(c) $\frac{45}{100}$, $\frac{54}{100}$, $\frac{5}{10}$, $\frac{4}{10}$

$\frac{45}{100}$; $\frac{54}{100}$; $\frac{5}{10} = \frac{50}{100}$; $\frac{4}{10} = \frac{40}{100}$

Longest length = $\frac{54}{100}$

Shortest length = $\frac{40}{100}$

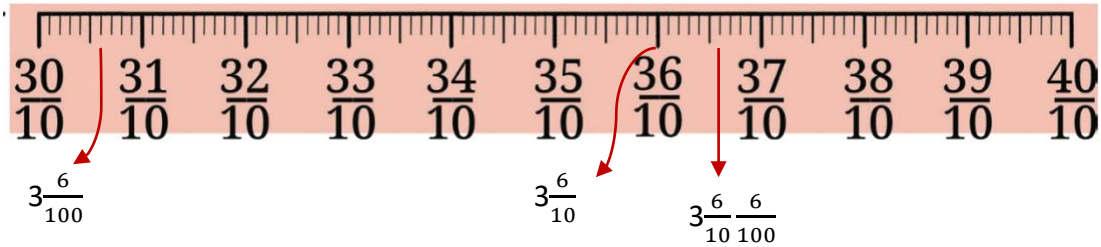


(d) $3\frac{6}{10}$, $3\frac{6}{100}$, $3\frac{6}{10}\frac{6}{100}$

$3\frac{6}{10} = \frac{36}{10}$; $3\frac{6}{100} = \frac{30}{10}\frac{6}{100}$; $3\frac{6}{10}\frac{6}{100} = \frac{36}{10}\frac{6}{100}$

Largest number = $3\frac{6}{10}\frac{6}{100}$

Smallest number = $3\frac{6}{100}$



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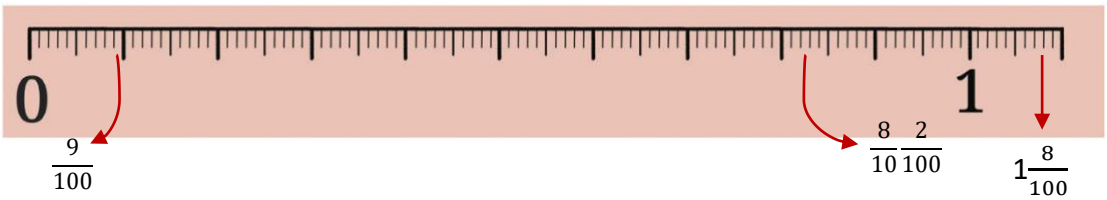
(e) $\frac{8}{10}\ \frac{2}{100}, \frac{9}{100}, 1\frac{8}{100}$

Largest number = $1\frac{8}{100}$

Smallest number = $\frac{9}{100}$



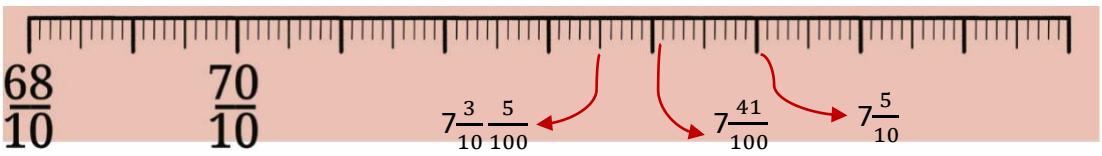
(f) $7\frac{3}{10}\ \frac{5}{100}, 7\frac{5}{10}, 7\frac{41}{100}$

$7\frac{3}{10}\ \frac{5}{100} = \frac{73}{10}\ \frac{5}{100}$; $7\frac{5}{10} = \frac{75}{10}$

$7\frac{41}{100} = 7 + \frac{41}{100} = \frac{70}{10} + \frac{41}{100} = \frac{70}{10} + \frac{40}{100} + \frac{1}{100} = \frac{70}{10} + \frac{4}{10} + \frac{1}{100} = \frac{74}{10} + \frac{1}{100} = \frac{74}{10}\ \frac{1}{100}$

Largest number = $7\frac{5}{10}$

Smallest number = $7\frac{3}{10}\ \frac{5}{100}$



(g) $\frac{65}{10}\ \frac{15}{100}, 5\frac{87}{100}, 5\frac{7}{100}$

$\frac{65}{10}\ \frac{15}{100} = \frac{65}{10} + \frac{15}{100} = \frac{65}{10} + \frac{10}{100} + \frac{5}{100} = \frac{65}{10} + \frac{1}{10} + \frac{5}{100} = \frac{66}{10} + \frac{5}{100} = \frac{66}{10}\ \frac{5}{100}$

$5\frac{87}{100} = 5 + \frac{87}{100} = 5 + \frac{80}{100} + \frac{7}{100} = 5 + \frac{8}{10} + \frac{7}{100} = 5\ \frac{8}{10}\ \frac{7}{100}$

$5\frac{7}{100}$

Largest number = $\frac{65}{10}\ \frac{15}{100}$

Smallest number = $5\frac{7}{100}$

Q. What will be the sum of $15\frac{3}{10}\frac{4}{100}$ and $2\frac{6}{10}\frac{8}{100}$?

Solution:

Method 1: $15\frac{3}{10}\frac{4}{100} + 2\frac{6}{10}\frac{8}{100} = (15 + 2) + \left(\frac{3}{10} + \frac{6}{10}\right) + \left(\frac{4}{100} + \frac{8}{100}\right)$

$= 17 + \frac{9}{10} + \frac{12}{100}$

$= 17 + \frac{9}{10} + \frac{10}{100} + \frac{2}{100}$

$= 17 + \frac{9}{10} + \frac{1}{10} + \frac{2}{100}$

$= 17 + \frac{10}{10} + \frac{2}{100}$

$= 17 + 1 + \frac{2}{100} = 18 + \frac{2}{100}$.

Method 2: $15\frac{3}{10}\frac{4}{100} + 2\frac{6}{10}\frac{8}{100}$

$15\ \frac{3}{10}\ \frac{4}{100}$

$+ 2\ \frac{6}{10}\ \frac{8}{100}$

$17\ \frac{9}{10}\ \frac{12}{100}$

$= 17\ \frac{10}{10}\ \frac{2}{100}$

$= 18\ \frac{2}{100}$.

Q. Are both these methods different?

Solution:

No, both methods are the same in logic and result but differ in structure. Method 1 uses a step-by-step horizontal layout for addition, while Method 2 uses a vertical layout.

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Q. Solve this by converting to hundredths. $25\frac{9}{10} - 6\frac{4}{10}\frac{7}{100}$

Solution:

$25\frac{9}{10} = 25\frac{90}{100}$; $6\frac{4}{10}\frac{7}{100} = 6\frac{47}{100}$

$25\frac{9}{10} - 6\frac{4}{10}\frac{7}{100} = 25\frac{90}{100} - 6\frac{47}{100} = (25 - 6) + \left(\frac{90}{100} - \frac{47}{100}\right) = 19 + \frac{43}{100} = 19\frac{43}{100}$.

Figure it out

Q. Find the sums and differences:

(a) $\frac{3}{10} + 3\frac{4}{100}$

(b) $9\frac{5}{10}\frac{7}{100} + 2\frac{1}{10}\frac{3}{100}$

(c) $15\frac{6}{10}\frac{4}{100} + 14\frac{3}{10}\frac{6}{100}$

(d) $7\frac{7}{100} - 4\frac{4}{100}$

(e) $8\frac{6}{100} - 5\frac{3}{100}$

(f) $12\frac{6}{100}\frac{2}{100} - \frac{9}{10}\frac{9}{100}$

Solution:

(a) $\frac{3}{10} + 3\frac{4}{100} = \frac{30}{100} + 3 + \frac{4}{100} = 3 + \left(\frac{30}{100} + \frac{4}{100}\right) = 3 + \frac{34}{100} = 3\frac{34}{100}$.

(b) $9\frac{5}{10}\frac{7}{100} + 2\frac{1}{10}\frac{3}{100} = (9 + 2) + \left(\frac{5}{10} + \frac{1}{10}\right) + \left(\frac{7}{100} + \frac{3}{100}\right)$

$= 11 + \left(\frac{5+1}{10}\right) + \left(\frac{7+3}{100}\right)$

$= 11 + \frac{6}{10} + \frac{10}{100}$

$= 11 + \frac{6}{10} + \frac{1}{10} = 11 + \frac{7}{10} = 11\frac{7}{10}$.

(c) $15\frac{6}{10}\frac{4}{100} + 14\frac{3}{10}\frac{6}{100} = (15 + 14) + \left(\frac{6}{10} + \frac{3}{10}\right) + \left(\frac{4}{100} + \frac{6}{100}\right)$

$= 29 + \left(\frac{6+3}{10}\right) + \left(\frac{4+6}{100}\right)$

$= 29 + \frac{9}{10} + \frac{10}{100}$

$= 29 + \frac{9}{10} + \frac{1}{10}$

$= 29 + \frac{10}{10} = 29 + 1 = 30$.

(d) $7\frac{7}{100} - 4\frac{4}{100} = (7 - 4) + \left(\frac{7}{100} - \frac{4}{100}\right) = 3 + \frac{3}{100} = 3\frac{3}{100}$.

(e) $8\frac{6}{100} - 5\frac{3}{100} = (8 - 5) + \left(\frac{6}{100} - \frac{3}{100}\right) = 3 + \frac{3}{100} = 3\frac{3}{100}$.

(f) $12\frac{6}{10}\frac{2}{100} - \frac{9}{10}\frac{9}{100} = 12\frac{62}{100} - \frac{99}{100}$

$= 11 + 1 + \frac{62}{100} - \left(\frac{99}{100}\right)$

$= 11 + \frac{100}{100} + \frac{62}{100} - \left(\frac{99}{100}\right)$

$= 11 + \frac{162}{100} - \left(\frac{99}{100}\right)$

$$= 11 + \left(\frac{162}{100} - \frac{99}{100}\right)$$
$$= 11 + \frac{63}{100} = 11\frac{63}{100}.$$

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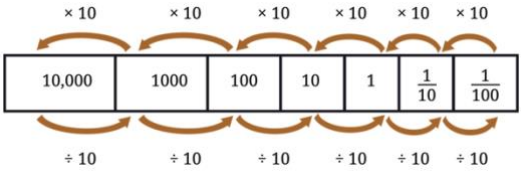
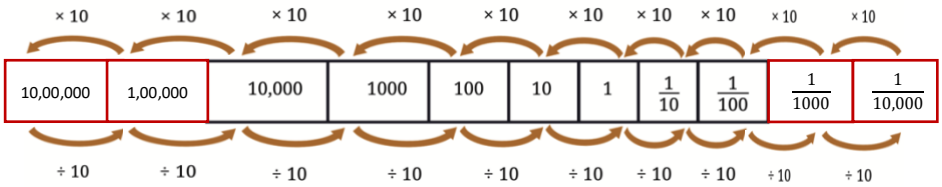


Q. Can we extend this further?
Solution:
Yes, it can be extended on both sides infinitely.



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Q. We can ask similar questions about fractional parts:
(a) How many thousandths make one unit?
(b) How many thousandths make one tenth?
(c) How many thousandths make one hundredth?
(d) How many tenths make one ten?
(e) How many hundredths make one ten?
Solution:
(a) Since, $\frac{1}{1000} \times 1000 = 1$.
∴ 1000 thousandths make one unit.

(b) Since, $\frac{1}{1000} \times 100 = \frac{1}{10}$.
∴ 100 thousandths make one tenth.

(c) Since, $\frac{1}{1000} \times 10 = \frac{1}{100}$.
∴ 10 thousandths make one hundredth.

(d) Since, $\frac{1}{10} \times 100 = 10$.
∴ 100 tenths make one ten.

(e) Since, $\frac{1}{100} \times 1000 = 10$.
∴ 1000 tenths make one ten.

Q. We can ask similar questions about fractional parts:
(a) How many hundredths make one unit?
(b) How many tenths make one unit?
(c) How many tenths make one hundredth?
(d) How many hundredths make one tenth?
Solution:
(a) Since, $\frac{1}{100} \times 100 = 1$.
∴ 100 hundredths make one unit.

(b) Since, $\frac{1}{10} \times 10 = 1$.
∴ 10 tenths make one unit.

(c) Since, $\frac{1}{10} \times \frac{1}{10} = \frac{1}{100}$.
∴ $\frac{1}{10}$ tenths make one hundredth.

(d) Since, $\frac{1}{100} \times 10 = \frac{1}{10}$.
∴ 10 hundredths make one tenth.

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Q. Make a place value table similar to the one above. Write each quantity in decimal form and in terms of place value and read the number:
(a) 2 ones, 3 tenths and 5 hundredths
(b) 1 ten and 5 tenths
(c) 4 ones and 6 hundredths
(d) 1 hundred, 1 one and 1 hundredth
(e) $\frac{8}{100}$ and $\frac{9}{10}$
(f) $\frac{5}{100}$
(g) $\frac{1}{10}$
(h) $2\frac{1}{100}$, $4\frac{1}{10}$ and $7\frac{1}{1000}$
Solution:

Quantity	Decimal Notation
(a) 2 ones, 3 tenths and 5 hundredths $(2 + \frac{3}{10} + \frac{5}{100})$	2.35
b) 1 ten and 5 tenths $(10 + 0 + \frac{5}{10})$	10.5
(c) 4 ones and 6 hundredths $(4 + 0 + \frac{6}{100})$	4.06
(d) 1 hundred, 1 one and 1 hundredth $(100 + 0 + 1 + 0 + \frac{1}{100})$	101.01
(e) $\frac{8}{100}$ and $\frac{9}{10}$ $(\frac{9}{10} + \frac{8}{100})$	0.98
(f) $\frac{5}{100}$	0.05
(g) $\frac{1}{10}$	0.1
(h) $2\frac{1}{100}$, $4\frac{1}{10}$ and $7\frac{1}{1000}$ $(\frac{4}{10} + \frac{2}{100} + \frac{7}{1000})$	0.427

Decimal Number	Hundreds	Tens	Units	Tenths	Hundredths	Thousandths
(a) 2.35			2×1	$3 \times \frac{1}{10}$	$5 \times \frac{1}{100}$	
(b) 10.5		1×10	0×1	$5 \times \frac{1}{10}$		
(c) 4.06			4×1	$0 \times \frac{1}{10}$	$6 \times \frac{1}{100}$	
(d) 101.01	1×100	0×10	1×1	$0 \times \frac{1}{10}$	$1 \times \frac{1}{100}$	
(e) 0.98				$9 \times \frac{1}{10}$	$8 \times \frac{1}{100}$	
(f) 0.05				$0 \times \frac{1}{10}$	$5 \times \frac{1}{100}$	
(g) 0.1				$1 \times \frac{1}{10}$		
(h) 0.427				$4 \times \frac{1}{10}$	$2 \times \frac{1}{100}$	$7 \times \frac{1}{1000}$

(a) 2.35 – Two point three five.
(b) 10.35 – Ten point three five.
(c) 4.06 – Four point zero six.
(d) 101.01 – One hundred one point zero one.
(e) 0.98 – zero point nine eight.
(f) 0.05 – zero-point zero five.
(g) 0.1 – zero point one.
(h) 0.427 – zero point four two seven.

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Q. Write these quantities in decimal form: (a) 234 hundredths, (b) 105 tenths.
Solution:
(a) 234 hundredths = $\frac{234}{100}$ = 2.34

(b) 105 tenths = $\frac{105}{10}$ = 10.5

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Q. Fill in the blanks below (mm <–> cm)

12 mm = 1.2 cm	56 mm = 5.6 cm	70 mm = _____
_____ = 0.9 cm	134 mm =_____	_____ = 203.6 cm

Solution:
70 mm = $\frac{70}{10}$ cm = 7cm

0.9 cm = (0.9 × 10) mm = $\left(\frac{9}{10} \times 10\right)$ mm = 9 mm

134 mm = $\frac{134}{10}$ cm = 13.4 cm

203.6 cm = (203.6 × 10) mm = $\left(\frac{2036}{10} \times 10\right)$ mm = 2036 mm

12 mm = 1.2 cm	56 mm = 5.6 cm	70 mm = 7cm
9 mm = 0.9 cm	134 mm = 13.4 cm	2036 mm = 203.6 cm

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Q. Fill in the blanks below (cm <–> m):

36 cm = _____	50 cm = _____	_____ = 0.89 m
4 cm = _____	325 cm = _____	_____ = 2.07 m

Solution:
36 cm = $\frac{36}{100}$ m = $\left(\frac{30}{100} + \frac{6}{100}\right)$ m = $\left(\frac{3}{10} + \frac{6}{100}\right)$ m = 0.36 m

50 cm = $\frac{50}{100}$ m = $\frac{5}{10}$ m = 0.5 m

0.89 m = (0.89 × 100) cm = $\left(\frac{89}{100} \times 100\right)$ cm = 89 cm

4 cm = $\frac{4}{100}$ m = 0.04 m

325 cm = $\frac{325}{100}$ m = $\left(\frac{300}{100} + \frac{20}{100} + \frac{5}{100}\right)$ m = $\left(3 + \frac{2}{10} + \frac{5}{100}\right)$ m = 3.25 m

2.07 m = (2.07 × 100) cm = $\left(\frac{207}{100} \times 100\right)$ cm = 207 cm

36 cm = 0.36 m	50 cm = 0.5 m	89 cm = 0.89 m
4 cm = 0.04 m	325 cm = 3.25 m	207 cm = 2.07 m

Q. How many mm does 1 meter have?
Solution:
1 m = (1 × 100) cm = 100 cm = (100 × 10) mm = 1000 mm.

Q. Can we write 1 mm = $\frac{1}{1000}$ m?
Solution:
Yes, 1 mm can be written as $\frac{1}{1000}$ m.
Because 1 mm = $\frac{1}{10}$ cm = $\frac{1}{10 \times 100}$ m = $\frac{1}{1000}$ m

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Q. Fill in the blanks below (g <–> kg)

465 g = _____	68 g = _____	1560 g = _____
704 g = _____	_____ = 0.56 kg	_____ = 2.5 kg

Solution:
465 g = $\frac{465}{1000}$ kg = $\left(\frac{400}{1000} + \frac{60}{1000} + \frac{5}{1000}\right)$ kg = $\left(\frac{4}{10} + \frac{6}{100} + \frac{5}{1000}\right)$ kg = 0.465 kg

68 g = $\frac{68}{1000}$ kg = $\left(\frac{60}{1000} + \frac{8}{1000}\right)$ kg = $\left(\frac{6}{100} + \frac{8}{1000}\right)$ kg = 0.068 kg

1560 g = $\frac{1560}{1000}$ kg = $\left(\frac{1000}{1000} + \frac{500}{1000} + \frac{60}{1000}\right)$ kg = $\left(1 + \frac{5}{10} + \frac{6}{100}\right)$ kg = 1.56 kg

704 g = $\frac{704}{1000}$ kg = $\left(\frac{700}{1000} + \frac{4}{1000}\right)$ kg = $\left(\frac{7}{10} + \frac{4}{1000}\right)$ kg = 0.704 kg

0.56 kg = (0.56 × 1000) g = $\left(\frac{56}{100} \times 1000\right)$ g = 560 g

2.5 kg = (2.5 × 1000) g = $\left(\frac{25}{10} \times 1000\right)$ g = 2500 g

465 g = 0.465 kg	68 g = 0.068 kg	1560 g = 1.56 kg
704 g = 0.704 kg	560 g = 0.56 kg	2500 g = 2.5 kg

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Q. Fill in the blanks below (rupee <–> paise)

10 p = _____	_____p = ₹ 0.05	_____p = ₹ 0.36
_____ = ₹ 0.50	99 p = _____	250 p = _____

Solution:

10 p = ₹ $\frac{10}{100}$ = ₹ $\frac{1}{10}$ = ₹ 0.1

₹ 0.05 = (0.05 × 100) p = $\left(\frac{5}{100} \times 100\right)$ p = 5 p

₹ 0.36 = (0.36 × 100) p = $\left(\frac{36}{100} \times 100\right)$ p = 36 p

₹ 0.50 = (0.50 × 100) p = $\left(\frac{50}{100} \times 100\right)$ p = 50 p

99 p = ₹ $\frac{99}{100}$ = ₹ $\left(\frac{90}{100} + \frac{9}{100}\right)$ = ₹ $\left(\frac{9}{10} + \frac{9}{100}\right)$ = ₹ 0.99

250 p = ₹ $\frac{250}{100}$ = ₹ $\left(\frac{200}{100} + \frac{50}{100}\right)$ = ₹ $\left(2 + \frac{5}{10}\right)$ = ₹ 2.5

10 p = ₹ 0.1	5 p = ₹ 0.05	36 p = ₹ 0.36
50 p = ₹ 0.50	99 p = ₹ 0.99	250 p = ₹ 2.5

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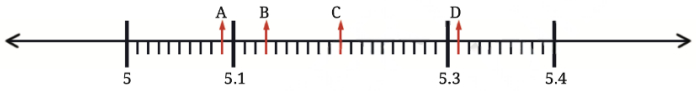
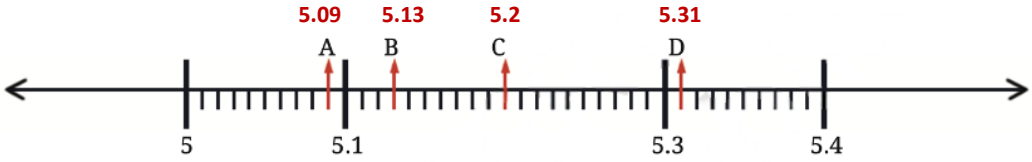
Q. Name all the divisions between 1 and 1.1 on the number line.

Solution:
1 – 1.01 – 1.02 – 1.03 – 1.04 – 1.05 – 1.06 – 1.07 – 1.08 – 1.09 -1.1

Q. Identify and write the decimal numbers against the letters.



Solution:



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Q. Can you tell which of these is the smallest and which is the largest?
0.2, 0.20, 0.200, 0.02, 0.002

Decimal number	Units	Tenths	Hundredths	Thousandths
0.2	0	2		
0.20	0	2	0	
0.200	0	2	0	0
0.02	0	0	2	
0.002	0	0	0	2

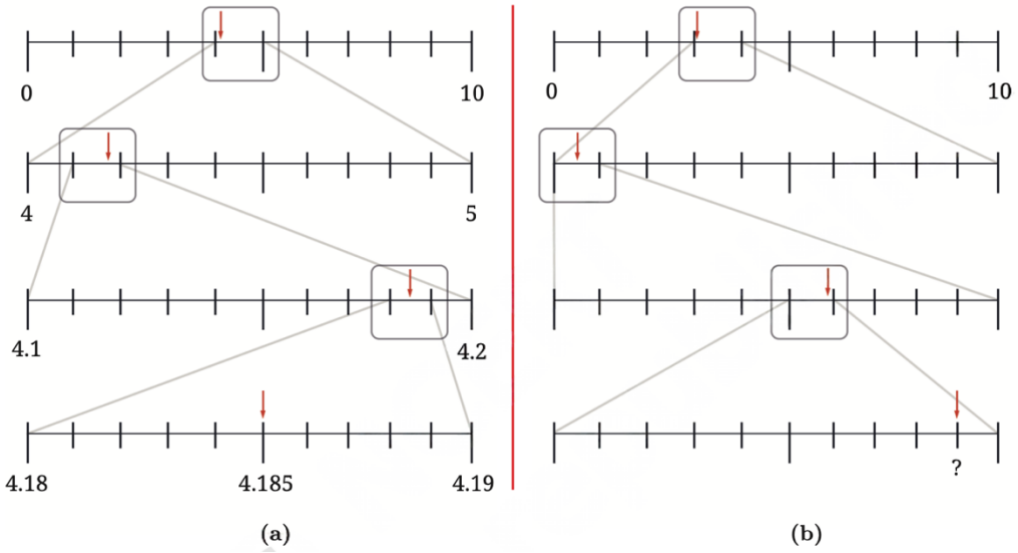
Solution:
0.002 < 0.02 < 0.2 = 0.20 = 0.200
Smallest = 0.002
Largest = 0.2

Q. Which of these are the same: 4.5, 4.05, 0.405, 4.050, 4.50, 4.005, 04.50?
Solution:

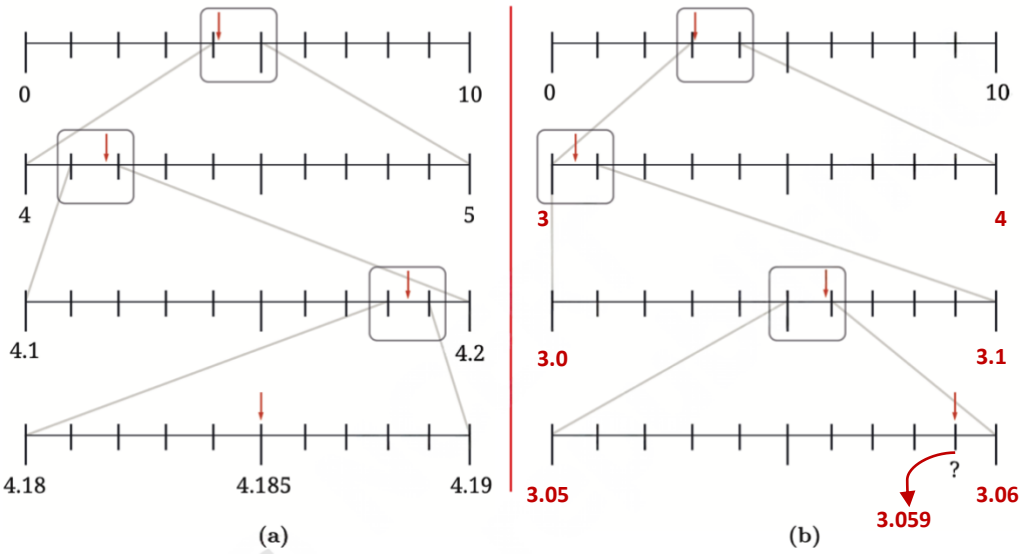
Decimal Number	Units	Tenths	Hundredths	Thousandths
4.5	4	5		
4.05	4	0	5	
0.405	0	4	0	5
4.050	4	0	5	0
4.50	4	5	0	
4.005	4	0	0	5
04.50	4	5	0	

Therefore,
4.50 = 04.50 & 4.05 = 4.050

Q. Identify the decimal number in the last number line in Figure (b) denoted by '?'.



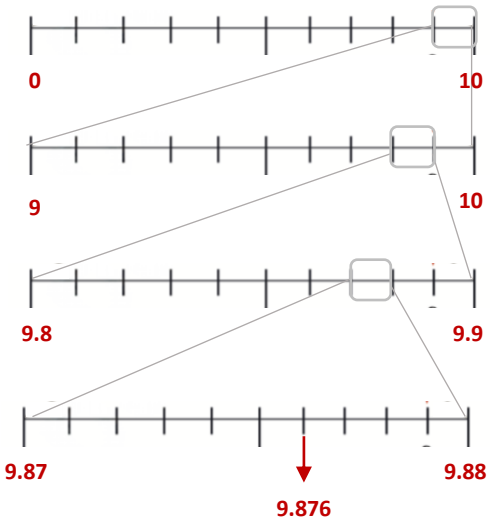
Answer:



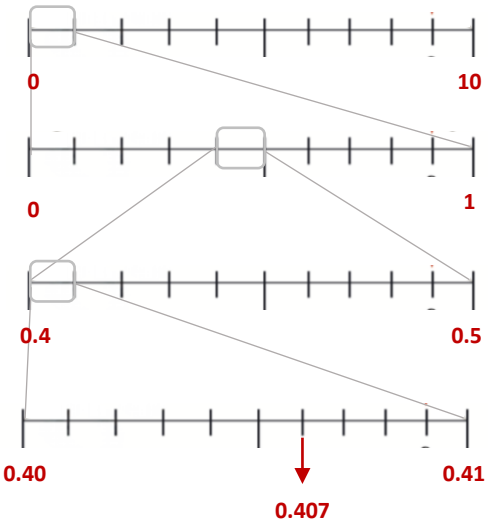
Q. Make such number lines for the decimal numbers: (a) 9.876 (b) 0.407.

Solution:

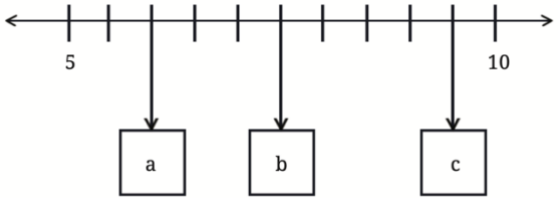
(a) 9.876



(b) 0.407



Q. In the number line shown below, what decimal numbers do the boxes labelled ‘a’, ‘b’, and ‘c’ denote?



Solution:
Divisions between 5 and 10 = 10
Each division= $\frac{10-5}{10} = \frac{5}{10}$ = 0.5 units

Therefore,
a = 5 + (2 × 0.5) = 5 + 1 = 6
b = 5 + (5 × 0.5) = 5 + 2.5 = 7.5
c = 5 + (9 × 0.5) = 5 + 4.5 = 9.5

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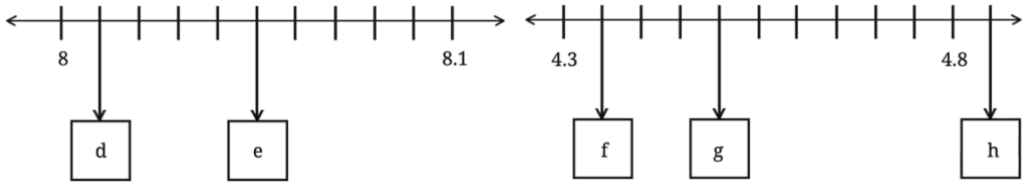
Q. Using similar reasoning find out the decimal numbers in the boxes below.



Solution:
(i) Divisions between 8 and 8.1 = 10
Each division = (8.1 – 8) ÷ 10 = 0.1 ÷ 10 = $\frac{1}{10} \times \frac{1}{10} = \frac{1}{100}$ = 0.01
Therefore,
d = 8 + 0.01 = 8.01.
e = 8 + (5 × 0.01) = 8 + 0.05 = 8.05.

(ii) Divisions between 4.3 and 4.8 = 10
Each division = (4.8 – 4.3) ÷ 10 = 0.5 ÷ 10 = $\frac{5}{10} \times \frac{1}{10} = \frac{5}{100}$ = 0.05
Therefore,
f = 4.3 + 0.05 = 4.35.
g = 4.3 + (4 × 0.05) = 4.3 + 0.2 = 4.50.
h = 4.3 + (11 × 0.05) = 4.3 + 0.55 = 4.85.

Q. Which is larger: 6.456 or 6.465?
Solution
Comparing both numbers:

Units place – Both have 6 in the units place.
Tenths place – Both have 4 in the tenths place.
Hundredths place – 6.456 has 5 in the hundredths place, while 6.465 has 6.
Since 6 > 5,
6.465 is greater than 6.456 at the hundredths place.
Therefore, 6.465 is the larger number.

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Q. Why can we stop comparing at this point? Can we be sure that whatever digits are there after this will not affect our conclusion?
Solution:
When comparing decimal numbers, stop at the place value where the digits are different. The number with the larger digit at that place is the greater number.

Q. Which decimal number is greater?
(a) 1.23 or 1.32
(b) 3.81 or 13.800
(c) 1.009 or 1.090
Solution:
(a) 1.23 or 1.32
Comparing both numbers:
Units place – Both have 1 in the units place.
Tenths place – 1.23 has 2 in the tenths place, while 1.32 has 3.
Since 3 > 2,
1.32 is greater than 1.23 at the tenths place.
Therefore, 1.32 is the larger number.

(b) 3.81 or 13.800 = 03.81 or 13.800
Comparing both numbers:
Tenths place – 3.81 has 0 in the tens place while 13.800 has 1.
Since 0 < 1,
13.800 is greater than 3.81 at the tens place.
Therefore, 13.800 is the larger number.

(c) 1.009 or 1.090
Comparing both numbers:
Units place – Both have 1 in the units place.
Tenths place – Both have 0 in the tenths place.
Hundredths place – 1.009 has 0 in the hundredths place while 1.090 has 9.
Since 0 < 9,
1.090 is greater than 1.009 at the hundredths place.
Therefore, 1.090 is the larger number.

Q. Which of the above is closest to 1.09? (Decimal numbers: 0.9, 1.1, 1.01, and 1.11)
Answer:
Arranging all numbers in ascending order:
0.9 < 1.01 < 1.09 < 1.1 < 1.11
Here, neighbours of 1.09 are 1.01 and 1.1.

1.1 (or 1.10) is $\frac{1}{100}$ away from 1.09
1.01 is $\frac{8}{100}$ away from 1.09

Therefore, 1.1 is closest to 1.09.

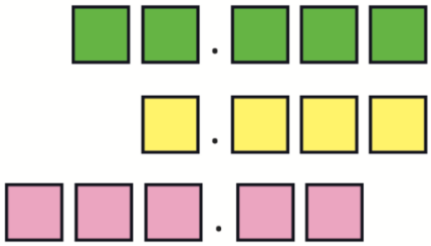
Q. Which among these is closest to 4: 3.56, 3.65, 3.099?
Solution:
Arranging all numbers in ascending order:
3.099 < 3.56 < 3.65

Now, compare the distance of each number from 4:
4 − 3.099 = 0.901
4 − 3.56 = 0.44
4 − 3.65 = 0.35
Among these, 3.65 is the smallest distance from 4.
Therefore, 3.65 is closest to 4.

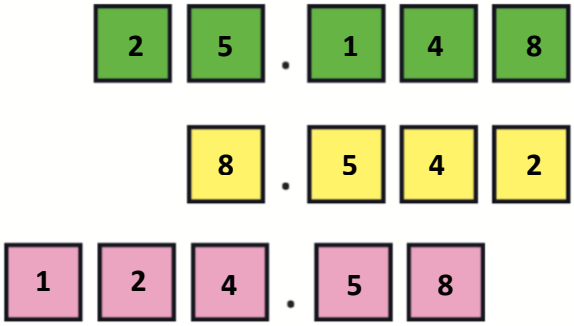
Q. Which among these is closest to 1: 0.8, 0.69, 1.08?
Solution:
Arranging all numbers in ascending order:
0.69 < 0.8 < 1.08

Now, compare the distance of each number from 1:
1 − 0.69 = 0.31
1 − 0.8 = 0.2
1.08 − 1 = 0.08
Among these, 1.08 is the smallest distance from 1.
Therefore, 1.08 is closest to 1

Q. In each case below use the digits 4, 1, 8, 2, and 5 exactly once and try to make a decimal number as close as possible to 25.



Solution:



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Q. Write the detailed place value computation for 84.691 – 77.345, and its compact form.
Solution:

$$\begin{array}{r} {\scriptstyle 7\,1\quad 8\,1} \\ 8\not{4}.6\not{9}1 \\ -\ 77.345 \\ \hline 7.346 \end{array}$$

Figure it Out

1. Find the sums:
(a) 5.3 + 2.6 (b) 18 + 8.8
(c) 2.15 + 5.26 (d) 9.01 + 9.10
(e) 29.19 + 9.91 (f) 0.934 + 0.6
(g) 0.75 + 0.03 (h) 6.236 + 0.487
Solution:
(a) 5.3 + 2.6 = 7.9

$$\begin{array}{r} 5.3 \\ +\ 2.6 \\ \hline 7.9 \end{array}$$

(b) 18 + 8.8 = 18.0 + 8.8 = 26.8

$$\begin{array}{r} {\scriptstyle 1} \\ 18.0 \\ +\ 8.8 \\ \hline 26.8 \end{array}$$

(c) 2.15 + 5.26 = 7.41

$$\begin{array}{r} {\scriptstyle 1} \\ 2.15 \\ +\ 5.26 \\ \hline 7.41 \end{array}$$

(d) 9.01 + 9.10 = 18.11

$$\begin{array}{r} {\scriptstyle 1} \\ 09.01 \\ +\ 9.10 \\ \hline 18.11 \end{array}$$

(e) 29.19 + 9.91 = 39.10

$$\begin{array}{r} {\scriptstyle 1\,1\,1} \\ 29.19 \\ +\ 9.91 \\ \hline 39.10 \end{array}$$

(f) 0.934 + 0.6 = 1.534

$$\begin{array}{r} {\scriptstyle 1} \\ 0.934 \\ +\ 0.6 \\ \hline 1.534 \end{array}$$

(g) 0.75 + 0.03 = 0.78

$$\begin{array}{r} 0.75 \\ +\ 0.03 \\ \hline 0.78 \end{array}$$

(h) 6.236 + 0. 487 = 6.723

$$\begin{array}{r} {\scriptstyle 1\,1} \\ 6.236 \\ +\ 0.487 \\ \hline 6.723 \end{array}$$

Q. Find the differences:

(a) 5.6 – 2.3 (b) 18 – 8.8
(c) 10.4 – 4.5 (d) 17 – 16.198
(e) 17 – 0.05 (f) 34.505 – 18.1
(g) 9.9 – 9.09 (h) 6.236 – 0.487

Solution:

(a) 5.6 – 2.3 = 3.3

$$\begin{array}{r} {\scriptstyle } \\ 5.6 \\ -\ 2.3 \\ \hline 3.3 \end{array}$$

(b) 18 – 8.8 = 9.2

$$\begin{array}{r} {\scriptstyle 7\,10} \\ 18.\cancel{0} \\ -\ 8.8 \\ \hline 9.2 \end{array}$$

(c) 10.4 – 4.5 = 5.9

$$\begin{array}{r} {\scriptstyle 0\,9\,14} \\ \cancel{10.4} \\ -\ 4.5 \\ \hline 5.9 \end{array}$$

(d) 17 – 16.198 = 0.802

$$\begin{array}{r} {\scriptstyle 6\ \ 9\,9\,10} \\ 17.\cancel{000} \\ -\ 16.198 \\ \hline 0.802 \end{array}$$

(e) 17 – 0.05 = 16.95

$$\begin{array}{r} {\scriptstyle 6\ \ 9\,10} \\ 17.\cancel{0}\cancel{0} \\ -\ 0.05 \\ \hline 16.95 \end{array}$$

(f) 34.505 – 18.1 = 16.405

$$\begin{array}{r} {\scriptstyle 2\ 14} \\ \cancel{3}\cancel{4}.505 \\ -\ 18.100 \\ \hline 16.405 \end{array}$$

(g) 9.9 – 9.09 = 0.81

$$\begin{array}{r} {\scriptstyle 8\,10} \\ 9.\cancel{9}0 \\ -\ 9.09 \\ \hline 0.81 \end{array}$$

(h) 6.236 – 0.487 = 5.749

$$\begin{array}{r} {\scriptstyle 5\,11\,12\,16} \\ \cancel{6}.\cancel{2}\cancel{3}6 \\ -\ 0.487 \\ \hline 5.749 \end{array}$$

Q. Continue this sequence and write the next 3 terms. (Sequence - 4.4, 4.8. 5.2, 5.6, 6.0, ...)
Solution:
Sequence: 4.4, 4.8, 5.2, 5.6, 6.0, ...
Each term increases by 0.4.
Next after 6.0: 6.0 + 0.4 = 6.4
Next: 6.4 + 0.4 = 6.8
Next: 6.8 + 0.4 = 7.2
∴ Next 3 terms are 6.4, 6.8, 7.2.

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Q. Similarly, identify the change and write the next 3 terms for each sequence given below. Try to do this computation mentally.

(a) 4.4, 4.45, 4.5, ... (b) 25.75, 26.25, 26.75, ...
(c) 10.56, 10.67, 10.78, ... (d) 13.5, 16, 18.5, ...
(e) 8.5, 9.4, 10.3, ... (f) 5, 4.95, 4.90, ...
(g) 12.45, 11.95, 11.45, ... (h) 36.5, 33, 29.5, ...

Solution:

(a) 4.4, 4.45, 4.5, ...
Each term increases by 0.05
Next after 4.5: 4.5 + 0.05 = 4.55
Next: 4.55 + 0.05 = 4.6
Next: 4.6 + 0.05 = 4.65
∴ Next 3 terms are 4.55, 4.6, 4.65

(b) 25.75, 26.25, 26.75, ...
Each term increases by 0.5
Next after 26.75: 26.75 + 0.5 = 27.25
Next: 27.25 + 0.5 = 27.75
Next: 27.75 + 0.5 = 28.25
∴ Next 3 terms are 27.25, 27.75, 28.25

(c) 10.56, 10.67, 10.78, ...
Each term increases by 0.11
Next after 10.78: 10.78 + 0.11 = 10.89
Next: 10.89 + 0.11 = 11.00
Next: 11.00 + 0.11 = 11.11
∴ Next 3 terms are 10.89, 11.00, 11.11

(d) 13.5, 16, 18.5, ...
Each term increases by 2.5
Next after 18.5: 18.5 + 2.5 = 21.0
Next: 21.0 + 2.5 = 23.5
Next: 23.5 + 2.5 = 26.0
∴ Next 3 terms are 21.0, 23.5, 26.0

(e) 8.5, 9.4, 10.3, ...
Each term increases by 0.9
Next after 10.3: 10.3 + 0.9 = 11.2
Next: 11.2 + 0.9 = 12.1
Next: 12.1 + 0.9 = 13.0
∴ Next 3 terms are 11.2, 12.1, 13.0

(f) 5, 4.95, 4.90, ...
Each term decreases by 0.05
Next after 4.90: 4.90 − 0.05 = 4.85

Next: 4.85 − 0.05 = 4.80
Next: 4.80 − 0.05 = 4.75
∴ Next 3 terms are 4.85, 4.80, 4.75

(g) 12.45, 11.95, 11.45, ...
Each term decreases by 0.5
Next after 11.45: 11.45 − 0.5 = 10.95
Next: 10.95 − 0.5 = 10.45
Next: 10.45 − 0.5 = 9.95
∴ Next 3 terms are 10.95, 10.45, 9.95

(h) 36.5, 33, 29.5, …
Each term decreases by 3.5
Next after 29.5: 29.5 − 3.5 = 26.0
Next: 26.0 − 3.5 = 22.5
Next: 22.5 − 3.5 = 19.0
∴ Next 3 terms are 26.0, 22.5, 19.0

Q. Make your own sequences and challenge your classmates to extend the pattern.
Solution:
Some more sequences and their solutions:
(i) 7.2, 7.5, 7.8, ...
Each term increases by 0.3
Next after 7.8: 7.8 + 0.3 = 8.1
Next: 8.1 + 0.3 = 8.4
Next: 8.4 + 0.3 = 8.7
∴ Next 3 terms are 8.1, 8.4, 8.7

(ii) 15, 14.6, 14.2, ...
Each term decreases by 0.4
Next after 14.2: 14.2 − 0.4 = 13.8
Next: 13.8 − 0.4 = 13.4
Next: 13.4 − 0.4 = 13.0
∴ Next 3 terms are 13.8, 13.4, 13.0

(iii) 22.1, 23.3, 24.5, ...
Each term increases by 1.2
Next after 24.5: 24.5 + 1.2 = 25.7
Next: 25.7 + 1.2 = 26.9
Next: 26.9 + 1.2 = 28.1
∴ Next 3 terms are 25.7, 26.9, 28.1

(iv) 0.5, 1.0, 1.5, ...
Each term increases by 0.5
Next after 1.5: 1.5 + 0.5 = 2.0
Next: 2.0 + 0.5 = 2.5

Next: 2.5 + 0.5 = 3.0
∴ Next 3 terms are 2.0, 2.5, 3.0

(v) 18.25, 17.75, 17.25, ...
Each term decreases by 0.5
Next after 17.25: 17.25 − 0.5 = 16.75
Next: 16.75 − 0.5 = 16.25
Next: 16.25 − 0.5 = 15.75
∴ Next 3 terms are 16.75, 16.25, 15.75

Q. What do you think about this claim? Verify if this is true for these numbers. Will it work for any 2 decimal numbers? (Claim: If we add two decimal numbers, then the sum will always be greater than the sum of their whole number parts. Also, the sum will always be less than 2 more than the sum of their whole number parts.)
Solution:
Both the claims hold true.
Verifying for 25.936 and 8.202:

Number 1	Number 2	Sum	Sum of whole parts	Is sum ≥ whole parts?	Is sum < whole parts +2
25.936	8.202	34.138	25 + 8 = 33	34.138 > 33	34.138 < 35

Verifying with other numbers:

Number 1	Number 2	Sum	Sum of whole parts	Is sum ≥ whole parts?	Is sum < whole parts +2
3.6	2.4	6.0	3 + 2 = 5	6 > 5	6 < 7
12.34	7.56	19.90	12 + 7 = 19	19.90 > 19	19.90 < 21
7.99	8.99	16.98	7 + 8 = 15	16.98 > 15	16.98 < 17

Q. What about for the sum of 25.93603259 and 8.202?
Solution:

Number 1	Number 2	Sum	Sum of whole parts	Is sum ≥ whole parts?	Is sum < whole parts +2
25.93603259	8.202	34.13803259	25 + 8 = 33	34.13803259 > 33	34.13803259 < 35

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Q. Where else can we see such 'non-decimals' with a decimal-like notation?
Solution:
(i) Train or flight schedules like 08.20 or 17.55 are in HH.MM format, not decimal.
(ii) Software versions like 3.6.2 version number—not a decimal, but a versioning system (3 major, 6 minor, 2 patch updates).
(iii) In books and chapter like Chapter 5.4 = Chapter 5, Section 4.

Figure it out

1. Convert the following fractions into decimals:
(a) $\frac{5}{10}$ (b) $\frac{16}{1000}$ (c) $\frac{12}{10}$ (d) $\frac{254}{1000}$
Solution:
(a) $\frac{5}{10}$ = 0.5

(b) $\frac{16}{1000}$ = 0.016

(c) $\frac{12}{10}$ = 1.2

(d) $\frac{254}{1000}$ = 0.254

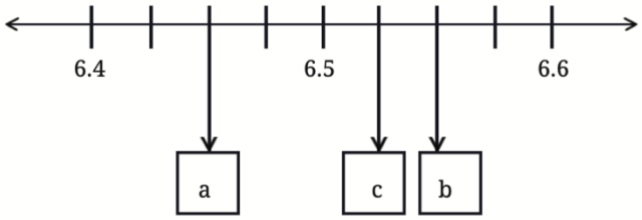
2. Convert the following decimals into a sum of tenths, hundredths and thousandths:
(a) 0.34 (b) 1.02 (c) 0.8 (d) 0.362
Solution:
(a) 0.34 = $\left(3 \times \frac{1}{10}\right) + \left(4 \times \frac{1}{100}\right)$.

(b) 1.02 = $(1 \times 1) + \left(2 \times \frac{1}{100}\right)$.

(c) 0.8 = $\left(8 \times \frac{1}{10}\right)$.

(d) 0.362 = $\left(3 \times \frac{1}{10}\right) + \left(6 \times \frac{1}{100}\right) + \left(2 \times \frac{1}{1000}\right)$.

3. What decimal number does each letter represent in the number line below?



Solution:
Divisions between 6.4 and 6.6 = 8
Each division = $\frac{6.6-6.4}{8} = \frac{0.2}{8} = \frac{2}{80}$ = 0.025
Therefore,
a = 6.4 + (2 $\times$ 0.025) = 6.4 + 0.050 = 6.425.
c = 6.4 + (5 $\times$ 0.025) = 6.4 + 0.125 = 6.525.
b = 6.4 + (6 $\times$ 0.025) = 6.4 + 0.150 = 6.550.

4. Arrange the following quantities in descending order:
(a) 11.01, 1.011, 1.101, 11.10, 1.01
(b) 2.567, 2.675, 2.768, 2.499, 2.698
(c) 4.678 g, 4.595 g, 4.600 g, 4.656 g, 4.666 g
(d) 33.13 m, 33.31 m, 33.133 m, 33.331 m, 33.313 m
Solution:
(a) 11.10 > 11.01 > 1.101 > 11.011 > 1.01.

(b) 2.768 > 2.698 > 2.675 > 2.567 > 2.499.

(c) 4.678 g > 4.666 g > 4.656 g > 4.600 g > 4.595 g.

(d) 33.331 m > 33.313 m > 33.31 m > 33.133 m > 33.13 m.

5. Using the digits 1, 4, 0, 8, and 6 make:
(a) the decimal number closest to 30
(b) the smallest possible decimal number between 100 and 1000.
Solution:
(a) Possible numbers: 14.860, 40.168
30 – 14.860 = 15.14
40.168 – 30 = 10.168
Hence, 40.168 is the closet number to 30.

(b) Smallest number between 100 and 1000 = 104.68

6. Will a decimal number with more digits be greater than a decimal number with fewer digits?

Solution:

Not always. A number with more decimal digits may be smaller.

Example:

0.9 has 1 decimal digit.

0.89 has 2 decimal digits.

But, 0.9 > 0.89.

7. Mahi purchases 0.25 kg of beans, 0.3 kg of carrots, 0.5 kg of potatoes, 0.2 kg of capsicums, and 0.05 kg of ginger. Calculate the total weight of the items she bought.

Solution:

Beans = 0.25 kg

Carrots = 0.3 kg

Potatoes = 0.5 kg

Capsicum = 0.2 kg

Ginger = 0.05 kg

Total weight = (0.25 + 0.3 + 0.5 + 0.2 + 0.05) kg = 1.3 kg

8. Pinto supplies 3.79 L, 4.2 L, and 4.25 L of milk to a milk dairy in the first three days. In 6 days, he supplies 25 litres of milk. Find the total quantity of milk supplied to the dairy in the last three days.

Solution:

Milk supplied in first 3 days = 3.79 + 4.2 + 4.25 = 12.24 L

Milk supplied in 6 days = 25 L

Milk supplied in last three days = 25 L – 12.24 L = 12.76.

9. Tinku weighed 35.75 kg in January and 34.50 kg in February. Has he gained or lost weight? How much is the change?

Solution:

Tinku's weight:

In January = 35.75 kg

In February = 34.50 kg

Change in weight = 35.75 kg − 34.50 kg = 1.25 kg

Tinku has lost weight and the change in weight is 1.25 kg.

11. How many millimeters make 1 kilometer?

Solution:

1 km = 1000 m = (1000 $\times$ 100) cm = (100000 $\times$ 10) = 10,00,000 mm.

$\therefore$ 10,00,000 mm make 1 km.

12. Indian Railways offers optional travel insurance for passengers who book e-tickets. It costs 45 paise per passenger. If 1 lakh people opt for insurance in a day, what is the total insurance fee paid?

Solution:

Cost per passenger = ₹0.45 (i.e., 45 paise)

Number of passengers = 1,00,000

Total insurance fee = 0.45 × 1,00,000 = $\frac{45}{100}\times$ 1,00,000 = ₹45,000.

13. Which is greater?

(a) $\frac{10}{1000}$ or $\frac{1}{10}$?

(b) One-hundredth or 90 thousandths?

(c) One-thousandth or 90 hundredths?

Solution:

(a) $\frac{10}{1000}$ or $\frac{1}{10}$

$\frac{10}{1000} = \frac{1}{100}$ = 0.01

$\frac{1}{10}$ = 0.1

0.01 < 0.1

$\therefore \frac{10}{1000} < \frac{1}{10}$.

(b) One-hundredth or 90 thousandths

One-hundredth = $\frac{1}{100}$ = 0.01

90 thousandths = $\frac{90}{1000} = \frac{9}{100}$ = 0.09

0.01 < 0.09

∴ One-hundredth < 90 thousandths.

(c) One-thousandth or 90 hundredths

One thousandth = $\frac{1}{1000}$ = 0.001

90 hundredths = $\frac{90}{100} = \frac{9}{10}$ = 0.9

0.001 < 0.9

∴ One-thousandth < 90 hundredths.

14. Write the decimal forms of the quantities mentioned (an example is given):

(a) 87 ones, 5 tenths and 60 hundredths = 88.10

(b) 12 tens and 12 tenths

(c) 10 tens, 10 ones, 10 tenths, and 10 hundredths

(d) 25 tens, 25 ones, 25 tenths, and 25 hundredths

Solution:

(a) 87 ones, 5 tenths and 60 hundredths = $(87 \times 1) + \left(5 \times \frac{1}{10}\right) + \left(60 \times \frac{1}{100}\right)$

$= 87 + \frac{5}{10} + \frac{6}{10}$

= 87 + 0.5 + 0.6 = 88.10

(b) 12 tens and 12 tenths = $(12 \times 10) + \left(12 \times \frac{1}{10}\right)$

= $120 + \frac{12}{10}$

= 120 + 1.2 = 121.2

(c) 10 tens, 10 ones, 10 tenths, and 10 hundredths

= $(10 \times 10) + (10 \times 1) + \left(10 \times \frac{1}{10}\right) + \left(10 \times \frac{1}{100}\right)$

= $100 + 10 + 1 + \frac{1}{10}$

= 111 + 10 + 1 + 0.1

= 111.1

(d) 25 tens, 25 ones, 25 tenths, and 25 hundredths

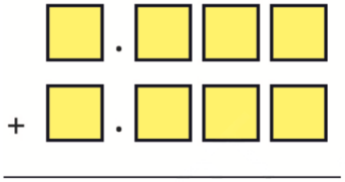
= $(25 \times 10) + (25 \times 1) + \left(25 \times \frac{1}{10}\right) + \left(25 \times \frac{1}{100}\right)$

= $250 + 25 + \frac{25}{10} + \frac{25}{100}$

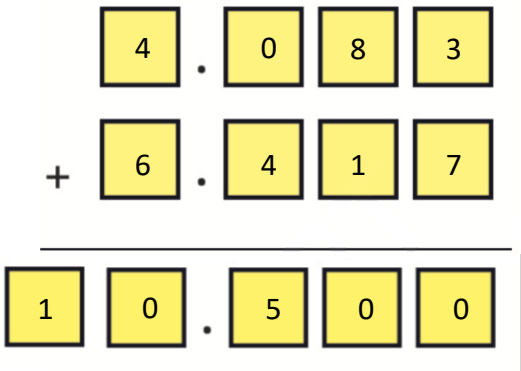
= 250 + 25 + 2.5 + 0.25

= 277.75

15. Using each digit 0 – 9 not more than once, fill the boxes below so that the sum is closest to 10.5:



Answer:



16. Write the following fractions in decimal form:

(a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) $\frac{1}{4}$ (d) $\frac{3}{4}$ (e) $\frac{1}{5}$ (f) $\frac{4}{5}$

Solution:

(a) $\frac{1}{2} = \frac{1}{2} \times 1$

$= \frac{1}{2} \times \frac{10}{10} = \frac{5}{10} = 0.5$

(b) $\frac{3}{2} = \frac{3}{2} \times 1$

$= \frac{3}{2} \times \frac{10}{10} = \frac{15}{10} = 1.5$

(c) $\frac{1}{4} = \frac{1}{4} \times 1$

$= \frac{1}{4} \times \frac{100}{100} = \frac{25}{100} = 0.25$

(d) $\frac{3}{4} = \frac{3}{4} \times 1$

$= \frac{3}{4} \times \frac{100}{100} = \frac{75}{100} = 0.75$

(e) $\frac{1}{5} = \frac{1}{5} \times 1$

$= \frac{1}{5} \times \frac{10}{10} = \frac{2}{10} = 0.2$

(f) $\frac{4}{5} = \frac{4}{5} \times 1$

$= \frac{4}{5} \times \frac{10}{10} = \frac{8}{10} = 0.8$