RATIOS

A DEFINITION

A.1 EXPRESSING RATIOS IN DIFFERENT FORMS

Ex 1: The ratio of 3 to 2 is 3:2 or $\frac{3}{2}$. Answer: The ratio of 3 to 2 can be written as 3:2 or $\frac{3}{2}$. Ex 2: The ratio of 4 to 5 is 4:5 or $\frac{4}{5}$. Answer: The ratio of 4 to 5 can be written as 4:5 or $\frac{4}{5}$. Ex 3: The ratio of 7 to 3 is 7:3 or $\frac{7}{3}$. Answer: The ratio of 7 to 3 can be written as 7:3 or $\frac{7}{3}$. Ex 4: The ratio of 6 to 9 is 6:9 or $\frac{6}{9}$. Answer: The ratio of 6 to 9 can be written as 6:9 or $\frac{6}{9}$.

B PART-PART RATIOS

B.1	FINDING	RATIOS	IN	PART-PART
RELATIONSHIPS				

Ex 5: What is the ratio of girls to boys?



Answer:

- There are 2 girls.
- There is 1 boy.
- The ratio of girls to boys is 2 : 1.

Ex 6: What is the ratio of girls to boys?



Answer:

- There are 2 girls.
- There are 3 boys.

- The ratio of girls to boys is 2 : 3.
- **Ex 7:** What is the ratio of triangles to circles?



Answer:

- There are 3 triangles.
- There is 1 circle.
- The ratio of triangles to circles is 3 : 1.

Ex 8: What is the ratio of circles to triangles?



Answer:

- There are 4 circles.
- There are 3 triangles.
- The ratio of circles to triangles is 4 : 3.

C PART-WHOLE RATIOS

C.1	FINDING	RATIOS	IN	WHOLE-PART
RELATI	ONSHIPS			

Ex 9: What is the ratio of girls to kids?



Answer:

- There are 2 girls.
- There are 3 kids.
- The ratio of girls to kids is $\frac{2}{3}$.

Ex 10: What is the ratio of girls to kids?



Answer:

- There are 2 girls.
- There are 5 kids.
- The ratio of girls to kids is $\frac{2}{\zeta}$.

Ex 11: What is the ratio of triangles to shapes?



Answer:

- There are 3 triangles.
- There are 4 shapes.
- The ratio of triangles to shapes is $\frac{3}{4}$.

Ex 12: What is the ratio of circles to shapes?



Answer:

- There are 4 circles.
- There are 7 shapes.
- The ratio of circles to shapes is $\frac{4}{7}$.

C.2 FINDING RATIOS IN WHOLE-PART RELATIONSHIPS

Ex 13: Anna loves to read books. In all, she has read 12 mystery novels, 8 science fiction novels, 5 fantasy novels, and 3 historical novels.

What is the ratio of Anna's mystery novels to all of her books?

12:28

Answer:

- Anna has read 12 mystery novels.
- The total number of books is 12 + 8 + 5 + 3 = 28.
- The ratio of mystery novels to all books is 12:28 or $\frac{12}{28}$.

Ex 14: The table shows the number of different types of birds swimming at a lake.

Bird	Number
Seagulls	1
Ducks	9
Geese	7
Swans	2

What is the ratio of swans to total birds?

2:19

Answer:

- There are 2 swans.
- The total number of birds is 1 + 9 + 7 + 2 = 19.
- The ratio of swans to total birds is 2:19 or $\frac{2}{10}$.

Ex 15: The table shows the number of different types of fruits in a basket.

Fruit	Number
Apples	3
Oranges	5
Bananas	4
Grapes	6

What is the ratio of apples to total fruits?

3:18

Answer:

- There are 3 apples.
- The total number of fruits is 3+5+4+6=18.
- The ratio of apples to total fruits is 3:18 or $\frac{3}{18}$.

Ex 16: The table shows the number of different types of vehicles in a parking lot.

Vehicle	Number
Cars	10
Bicycles	6
Motorcycles	4
Trucks	2

What is the ratio of trucks to total vehicles?

2:22

Answer:

- There are 2 trucks.
- The total number of vehicles is 10 + 6 + 4 + 2 = 22.
- The ratio of trucks to total vehicles is 2:22 or $\frac{2}{22}$.

Ex 17: Louis loves to play sports. In all, he has earned 5 swimming medals, 3 running medals, 6 cycling medals, and 2 triathlon medals.

What is the ratio of Louis's swimming medals to all of his medals?

5:16

Answer:

- Louis has earned 5 swimming medals.
- The total number of medals is 5 + 3 + 6 + 2 = 16.
- The ratio of swimming medals to all medals is 5:16 or $\frac{5}{16}$.



EQUIVALENT RATIOS D

D.1 SIMPLIFYING RATIOS

Ex 18: What is the ratio of red apples to all apples (write in simplified form)?



Answer:

- There are 2 red apples.
- There are 4 apples in total.
- The ratio of red apples to all apples is $\frac{2}{4}$.



• The simplified ratio is $\frac{1}{2}$ (half are red).

Ex 19: What is the ratio of red apples to all apples (write in simplified form)?



Answer:

- There are 4 red apples.
- There are 6 apples in total.
- The ratio of red apples to all apples is $\frac{4}{6}$.



Ex 20: What is the ratio of red apples to all apples (write in simplified form)?



Answer:

- There are 3 red apples.
- There are 6 apples in total.
- The ratio of red apples to all apples is $\frac{3}{6}$.



• The simplified ratio is $\frac{1}{2}$ (half are red).

Ex 21: What is the ratio of red apples to all apples (write in simplified form)?



Answer:

- There are 3 red apples.
- There are 9 apples in total.
- The ratio of red apples to all apples is $\frac{3}{9}$.

• The simplified ratio is $\frac{1}{3}$.

D.2 MULTIPLYING THE RATIOS

Ex 22: Multiply the ratio by 2:

$$3:5=6:10$$

Answer:



• 3:5=6:10.

Ex 23: Multiply the ratio by 3:

4:7 = 12:21

Answer:



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Ex 24: Multiply the ratio by 4:

$$5:3=20:12$$

Answer:

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•
$$\frac{5}{3} = \frac{20}{12}$$

$$\frac{5}{3} = \frac{5 \times 4}{3 \times 4}$$

$$= \frac{20}{12}$$

•
$$5:3=20:12.$$

Ex 25: Multiply the ratio by 5:

$$2:5 = 10:25$$

Answer:

•
$$\frac{2}{5} = \frac{10}{25}$$
$$\frac{2}{5} = \frac{2 \times 5}{5 \times 5}$$
$$= \frac{10}{25}$$

• 2:5=10:25.

D.3 FINDING THE MISSING VALUE

Ex 26:

$$1:2=2:4$$

Answer:



• 1:2=2:4.

Ex 27:

$$2:3 = 4:6$$

Answer:



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• 2:3=4:6.

Ex 28:

Answer:



3:5=9:15

• 3:5=9:15.

Ex 29:

4:7 = 8:14

14

Answer:



• 4:7=8:14.

Ex 30:

2:3=8:12

Answer:



•
$$2:3=8:12.$$

Ex 31:

$$3:2 = 30:20$$

Answer:



• 3:2=30:20.

E PROPORTION

E.1 IDENTIFYING THE PROPORTION

MCQ 32: Two vinaigrettes are being prepared:

- Vinaigrette A is made with 2 mL of oil and 1 mL of vinegar.
- Vinaigrette B is made with 4 mL of oil and 2 mL of vinegar.

Will these two vinaigrettes taste the same?

 \boxtimes Yes

 \Box No

Answer:



• Since both ratios are equal, there is a proportion. So, the vinaigrettes will taste the same.



A worker prepares a mixture with 4 kilos of cement and 6 liters of water.

Did he follow the recommended proportions?

 \boxtimes Yes

 \Box No

Answer:



• Since the two ratios are equal, the worker followed the recommended proportions.

MCQ 34: Two smoothie recipes are being prepared:

- Smoothie A is made with 3 cups of fruit and 2 cups of yogurt.
- Smoothie B is made with 6 cups of fruit and 4 cups of yogurt.

Will these two smoothies taste the same?

 \boxtimes Yes

 \Box No

Answer:



• Since both ratios are equal, the proportions are the same. Therefore, the smoothies will taste the same.

MCQ 35: A gardener uses a fertilizer mix:

- The recommended mix is 5 grams of fertilizer per 2 liters of water.
- The gardener prepares a mixture with 10 grams of fertilizer and 4 liters of water.
- Did the gardener follow the recommended proportions?

 \boxtimes Yes

 \square No

Answer:



• Since both ratios are equal, the gardener followed the recommended proportions.

F PART IN WHOLE-PART RELATIONSHIPS

F.1 RELATI	FINDING ONSHIPS	PARTS	IN	WHOLE-PART
Ex 36:				
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$\frac{1}{2}$ of 4 is	2.			





Ex 37:

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$\frac{2}{3}$ of 6 is 4.

Answer:



• $\frac{2}{3}$ of 6 is 4.

Ex 38:



 $\frac{1}{2}$ of 8 is 4.

Answer:



Ex 39:



 $\frac{3}{4}$ of 8 is 6.

Answer:



• $\frac{3}{4}$ of 8 is 6.

