

YEAR 8 MATHEMATICS WEEK 1 2020 (TERM 2)

Year: 8

Date: Tuesday 19 May 2020

STRAND: NUMBERS

TOPIC: Ratio

LESSON OUTCOME: At the end of this lesson student(s) should be able to obtain equivalent ratios and simplify ratios.

Instructions: Hi dear Parents/Guardians and students - In this Lesson students are going to obtain equivalent ratios and simplify ratios and do the selected questions for **Exercise 1.6**.

*[Note that all the Quizzes/Test and or Assignment will be based on the selected questions for each exercise. These lessons are designed for **one hour per Lesson**.]*

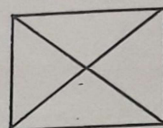
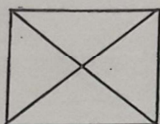
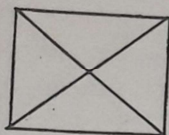
What to do: Do the following selected questions

Exercise 1.6: Q1 (b, f); Q6 (c, h); Q8; Q9; Q12

Solutions: Solutions will be available online via

<https://www.facebook.com/centralschoolemergencyforum/posts/108720557434149>

10. Write the ratio of the number of squares to the number of diagonals.



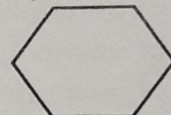
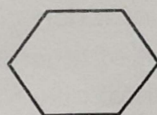
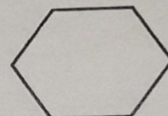
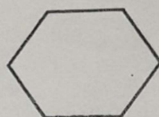
11. Use a ruler and measure the lines. For each pair, write the ratio of the length of the first line to the length of the second line.

(a) _____

(b) _____

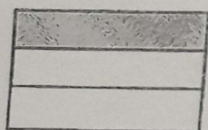
(c) _____

12. Write the ratio of the number of hexagons to the total number of sides.

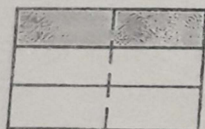


Equivalent ratios

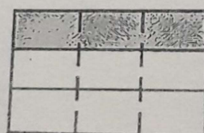
Look at the diagram.



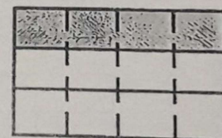
A



B



C



D

Each of the rectangles is the same size. The shaded area in each is the same. The ratio of shaded to unshaded in each is:

A : ratio is 1 : 2

B : ratio is 2 : 4

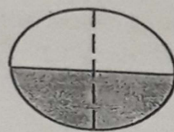
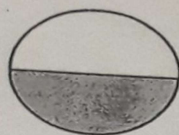
C : ratio is 3 : 6

D : ratio is 4 : 8

Since each of the above are the same, we can then say that:
1 : 2, 2 : 4, 3 : 6 and 4 : 8
are equivalent ratios.

Example 1

What are the three equivalent ratios shown below?



Answer: The ratio of shaded to unshaded gives the following equivalent ratios:

1 : 1, 2 : 2, 4 : 4.

Equivalent ratios are also obtained by multiplying or dividing the numbers in a ratio by the same amount.

Example 2

Find two more equivalent ratios to:

(a) 2 : 3

Answer:

$$\begin{array}{l} \times 2 \quad \left(\begin{array}{c} 2 : 3 \\ \rightarrow \\ 4 : 6 \end{array} \right) \quad \times 2 \\ = \\ \times 5 \quad \left(\begin{array}{c} 2 : 3 \\ \rightarrow \\ 10 : 15 \end{array} \right) \quad \times 5 \\ = \end{array}$$

The numbers must stay in the same order.

\therefore 2 : 3 is equivalent to 4 : 6 and 10 : 15

(b) 100 : 40

Answer:

$$\begin{array}{l} \div 10 \quad \left(\begin{array}{c} 100 : 40 \\ \rightarrow \\ 10 : 4 \end{array} \right) \quad \div 10 \\ = \\ \div 2 \quad \left(\begin{array}{c} 100 : 40 \\ \rightarrow \\ 50 : 20 \end{array} \right) \quad \div 2 \\ = \end{array}$$

The numbers must stay in the same order.

\therefore 100 : 40 is equivalent to 10 : 4 and 50 : 20.

Simplifying ratios

A ratio is in its "simplest form" when the numbers in the ratio are whole numbers and have been divided by their highest common factor.

Examples: Express the following ratios in their simplest form:

(a) 12 : 4

Answer:

$$\div 4 \quad \left(\begin{array}{c} 12 : 4 \\ \rightarrow \\ 3 : 1 \end{array} \right) \quad \div 4$$

4 is the HCF of 12 and 4

(b) 15 : 35

Answer:

$$\div 5 \quad \left(\begin{array}{c} 15 : 35 \\ \rightarrow \\ 3 : 7 \end{array} \right) \quad \div 5$$

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Exercise 1.6

1. Which of the following pairs of ratios are equivalent?

(a) $3 : 15$

(c) $6 : 12$

(e) $8 : 6$

$9 : 45$

$18 : 36$

$4 : 3$

(b) $7 : 5$

(d) $4 : 6$

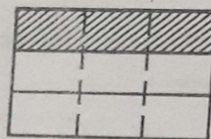
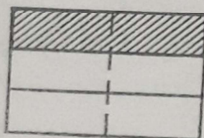
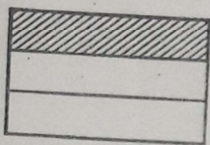
(f) $9 : 11$

$35 : 49$

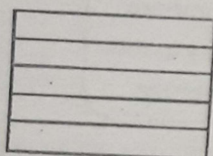
$8 : 6$

$27 : 33$

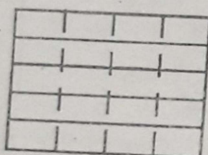
2. Find the three equivalent ratios shown in the diagrams below.



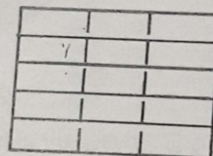
3. Draw these rectangles in your book and shade the equivalent ratios given.



$1 : 5$

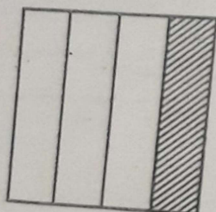


$4 : 20$

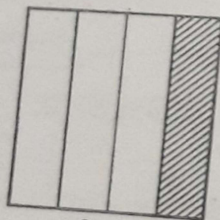


$3 : 15$

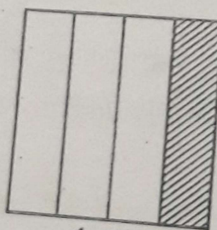
4. Draw these rectangles in your book and divide them to show the equivalent ratios.



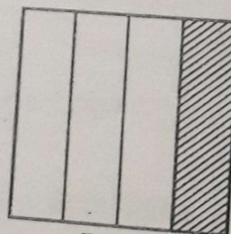
$1 : 4$



$2 : 8$



$4 : 16$



$5 : 20$

5. Write each of the following ratios in its simplest form:

(a) $50 : 100$

(d) $24 : 46$

(g) $28 : 8$

(b) $18 : 6$

(e) $500 : 175$

(h) $30 : 12$

(c) $2 : 12$

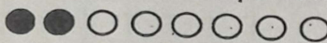

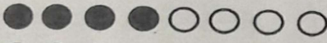
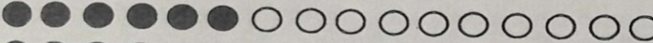

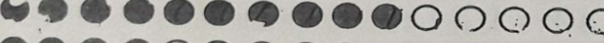
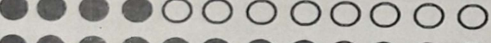


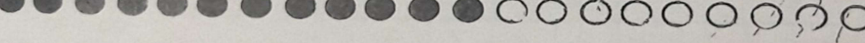
(f) $27 : 81$

(i) $40 : 24$

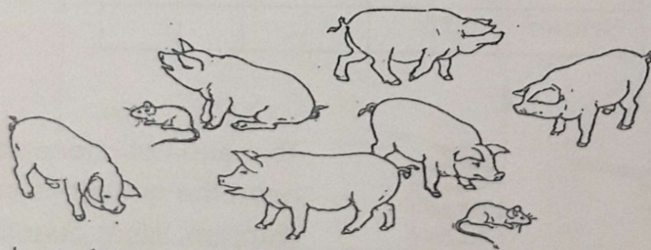
6. Copy the following, replacing # by the correct numbers.

- | | | |
|-----------------------------|------------------------------|-----------------------------|
| (a) $4 : 7$
$= 12 : \#$ | (d) $30 : 20$
$= \# : 10$ | (g) $\# : 18$
$= 11 : 9$ |
| (b) $11 : 3$
$= \# : 15$ | (e) $15 : \#$
$= 5 : 3$ | (h) $\# : 9$
$= 7 : 3$ |
| (c) $1 : 10$
$= 7 : \#$ | (f) $20 : \#$
$= 5 : 7$ | (i) $6 : \#$
$= 1 : 5$ |

7. For each of the following diagrams state the ratio which is being represented in its simplest form.

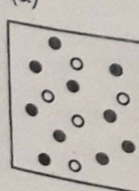
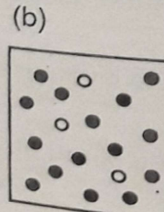
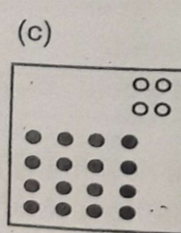
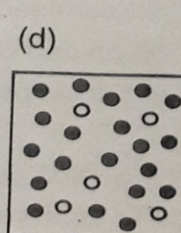
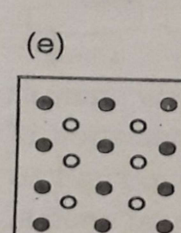
- (a) 
- (b) 
- (c) 
- (d) 
- (e) 
- (f) 
- (g) 
- (h) 
- (i) 
- (j) 

8. What is the ratio of mice to pigs in its simplest form?

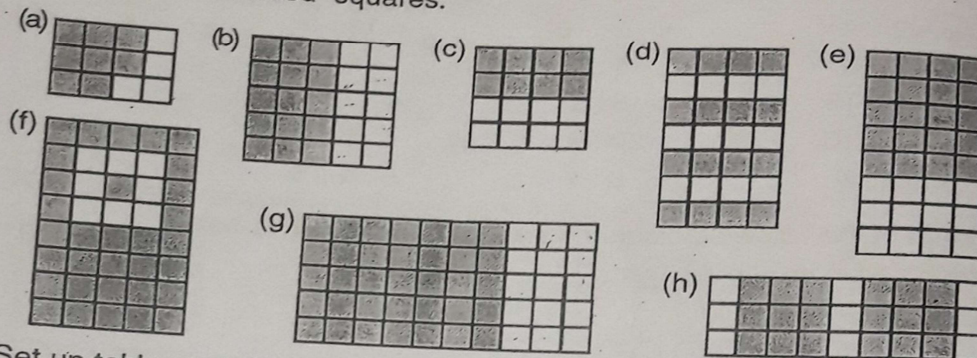


9. In a class there are 24 girls and 6 boys. Write the ratio of boys to girls in its simplest form.

10. In each of the pictures below, find the ratio of black beads to white beads in its simplest form.

- (a) 
- (b) 
- (c) 
- (d) 
- (e) 

11. For each diagram, write the ratio, in its simplest form, of shaded squares to unshaded squares.



12. Set up tables to help you solve these problems.

- (a) There are seven days in one week. How many days are there in 2, 3, 5, 8 and 10 weeks?

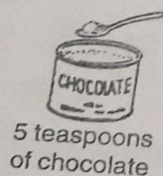
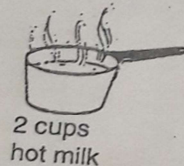
Weeks	1	2	3	5	8	10
Days	7					

- (b) A bricklayer can lay 60 bricks in one hour. How many bricks can he lay in 2, 3, 4, 7, and 9 hours?

Hours	1	2	3	4	7	9
Bricks	60					

Exercise 1.7

1.



To make hot chocolate for 2 people you need the quantities shown in the diagram. What quantities do you need for 8 people?

2.



To make a particular shade of purple paint you need 3 parts red paint for 4 parts blue paint. The diagram shows an example of the quantities which can be used.

- (a) How many litres of purple paint would you make if you used the quantities shown?
- (b) If you had 16 litres of blue paint how many litres of red paint would you need to add to achieve the right shade?
- (c) If you needed a total of 14 litres of paint for the job, what quantities of each paint would you need?