GRADE 7 RATIOS
CLOSED QUESTIONS

1. Simplify the following ratios.

12 : 18	24 : 36
15 : 45	21 : 28
32 : 48	27 : 63

2. Find the missing values.

a) 5 : 8 = 15 : ___

b) ___ : 9 = 4 : 6

3. A car travels 240 km in 4 hours.
What is the unit rate in kilometres per hour?

4. The ratio of red beads to blue beads is 3 : 7.
If there are 40 beads in total, how many are red?

5. A recipe uses flour and sugar in the ratio 4 : 5.
If 20 cups of flour are used, how many cups of sugar are needed?

6. The ratio of grade 6's to grade 7's in a class is 2 : 3.
There are 30 students in total.
How many are grade 6's? How many are grade 7's?

7. Explain why the ratios 6 : 9 and 2 : 3 are equivalent.
Use more than one method to justify your answer.

8. A student says:
“If you double both numbers in a ratio, the ratio changes.”
Do you agree? Explain.

9. Without calculating exact values, determine which is greater:
4 : 5 or 7 : 9.
Explain your reasoning.

10. Create a real life situation that could be represented by the ratio 3 : 8.
Explain what each part represents.

11. The ratio of cats to dogs is 5 : 7.
If 3 more cats are added, does the ratio remain proportional?
Explain why or why not.

12. Explain how a ratio can be written as a fraction.
Use an example to support your explanation.

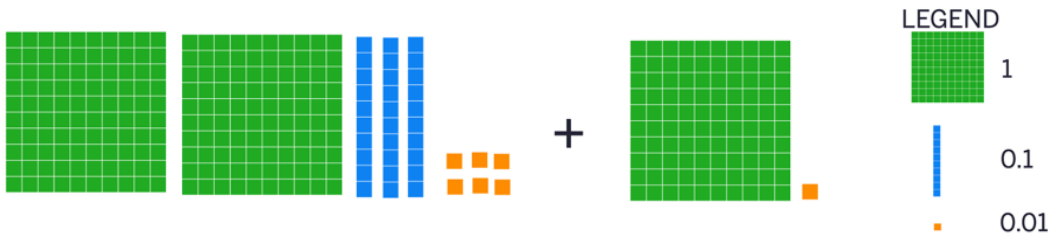
13. Two recipes use flour and sugar in ratios 2 : 3 and 4 : 5.
Are these proportional recipes? Explain how you know.

14. Store A sells 6 granola bars for 9 dollars.
Store B sells 10 granola bars for 14 dollars.
Without calculating both totals in detail, explain how you would determine which store offers the better deal.
Justify your reasoning.

15. A runner completes 15 km in 2 hours.
Two students found the unit rate in different ways.
One divided 15 ÷ 2.
The other doubled both numbers to get 30 km in 4 hours and then divided.
Are both strategies valid?
Explain why or why not.

16. The ratio of red marbles to blue marbles is 4 : 9.
Explain how you could determine the total number of marbles if you were told there are more than 100 marbles but fewer than 150.

1. Write an addition statement that represents the following model with base-ten blocks. Determine the sum of these decimal values.



2. Use front-end estimation to determine the sum of 62.57 and 28.41.

3. Find the value of 0.383 + 0.699 using base-ten blocks. Represent your thinking using pictures and numbers.

4. Express the subtraction statement, 0.04 – 0.003, in words.

5. Place the decimal point in the correct position in the answer to make a true statement. Explain your strategy.

a) $55.73 + $18.75 + $72.39 = $14687

b) 4189.675 – 1501.941 = 2687734

6. Find the value of each expression. Show your reasoning.

3250.52 – 465.6 =	22.563 + 45.22 + 4.088 =	2550.06 – 465.14 =

7. Replace the ☐ with a number to make each of the following statements true.

a)
$$\begin{array}{r} 12.03 \\ +\ \square \\ \hline 15.13 \end{array}$$

b)
$$\begin{array}{r} 870.49 \\ -\ \square \\ \hline 630.20 \end{array}$$

8. Estimate, then calculate. Describe the strategy you used.

a) 78.2 x 5

b) 259.8 x 6

9. Use base-ten blocks to find the product of 55.4 x 3.

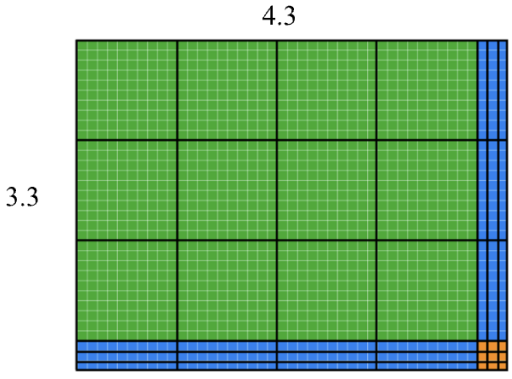
10. Find each product below using the equation 32 x 48 = 1536 and what you know about place value.

a) 3.2 x 4.8 =

b) 32 x (0.048) =

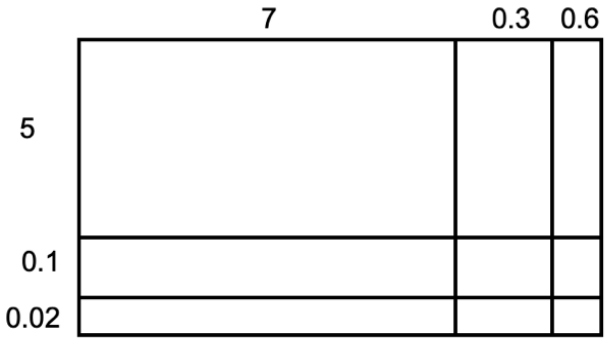
c) 0.032 x (3.2) =

11. Use the area model to determine the product of 4.3 x 3.3, then represent your thinking using numbers.

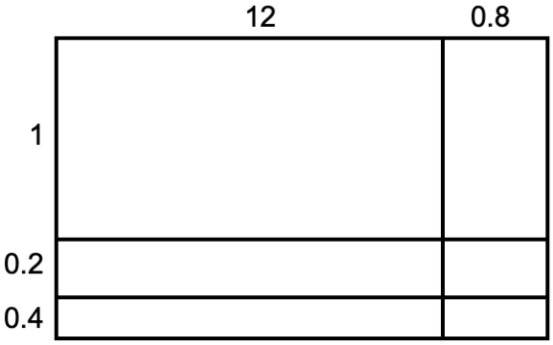


12. Use the area models (rectangle models) to find the products.

a)



b)



13. Calculate each without using a calculator. Show your thinking.

a) 2.87 x 73.48

b) 0.45 x 151.6

14. Estimate the quotient of 150.70 ÷ 2.6.

15. Use an area model to find the quotient of 150.70 ÷ 2.6.

16. Which of the following quotients has the same value as $5.04 \div 7$? Explain how you know.

a) $5.04 \div 70$
b) $50.4 \div 70$
c) $504,000 \div 700$
d) $504{,}000 \div 700,000$

17. Use base-ten blocks to model the calculation of $8 \div 1.5$.

18. Find the missing value of $36.8 \div 2.3$ using the area model. Show your thinking.

19. Calculate each without using a calculator. Show your thinking.

24.2 ÷ 1.1	13.25 ÷ 0.4	170.28 ÷ 0.08

20. What is the value of each expression?

(4.5 + 2.3) x 1.8 =	12. 5 – (3.2 + 2.8) =
8.4 ÷ 2 + 1.6 =	(12.5 + 3.75) ÷ (4.5 – 2.25) + 6.4 =

21. Which expression doesn't belong? Explain and justify your thinking using math.

a) 2 x 0.3
b) 2 x 3 x 0.1
c) 6 x 0.1
d) 0.1 x 6

22. I am thinking of two numbers. Neither number is a whole number. Their product is 12.78. What might the numbers be?

23. Two numbers multiply to give a product between 18 and 19. What might these numbers be?

24. I multiplied 27 by a decimal and got an answer less than 27. What might be the decimal that I multiplied 27 by? Give at least 5 possibilities.

25. The area of a rectangle is 3.9 units squared. What might the perimeter be?

26. Explain why $51.2 \div 6.4$ has the same value as $5.12 \div 0.64$.

27. Write two division statements that have the same value as $61.12 \div 3.2$.

1. There is 0.162 liter of water in a 1-liter bottle. How much more water should be put in the bottle so it contains exactly 1 liter? Show your reasoning.

2. Diego is 59.5 inches tall. His brother is 40.125 inches tall. How much taller than his brother is Diego? Show your reasoning.

3. A person rolls a ten-sided die multiple times. After each roll, they write the number in one of the available boxes. The goal is to create a question where the sum is as close to 10 as possible. Once a number has been written, it cannot be erased or rewritten.

$$\square \cdot \square + \square \cdot \square = 10$$

4. Jodi went to a concession stand that sells pretzels for $4.25, drinks for $2.85, and bags of popcorn for $1.99 each. He bought at least one of each item and spent no more than $15.

a) Could Jodi have purchased 2 pretzels, 2 drinks, and 2 bags of popcorn? Explain your reasoning.

b) Could he have bought 1 pretzel, 1 drink, and 5 bags of popcorn? Explain your reasoning.

5. A bag of nickels weighs 5.1 kilogram. Each nickel weighs 2.5 grams. About how many nickels are in the bag?

6. A roll of ribbon was 12 meters long. Diego cut 9 pieces of ribbon that were 0.4 meter each to tie some presents. He then used the remaining ribbon to make some wreaths. Each wreath required 0.6 meter. For each question, explain your reasoning.

a) How many meters of ribbon were available for making wreaths?
b) How many wreaths could Diego make with the available ribbon?

7. A swimming pool is being filled with water at a rate of 2.4 liters per minute. After 35 minutes, the pool already has 18.5 liters in it?

8. A car travels 248.6 km on the first day and 312.4km on the second day. On the third day it travels half the distanced of the second day. What is the total distance travelled?

TASK: Planning a Movie Night

You are organizing a movie night for 8 friends with a budget of $75. You need to provide snacks and drinks for everyone. Your plan should include:

- 2 types of snacks (e.g., popcorn, chips, candy)
- 2 types of drinks (e.g., soda, juice, ice tea, water)

Serving Size Guidelines

- Popcorn: 50g per person (1 large bag is about 200g)
- Chips: 28g per person (1 standard bag is about 200g)
- Candy: 57g per person (1 pack is about 113g)
- Drinks: 2 drinks per person (1 can/bottle is about 355mL)

Planning Rules

Choose the exact items to buy from a grocery store and decide on the quantities to buy of each items so that you stay on budget. Use the graphic organizer to record your choices, costs and total cost per person.

Item	**Quantity**	**Subtotal ($)**
	TOTAL COST	

a) Calculate the cost per person for the party.

b) Did you stay under budget? If not, revise your shopping list to ensure you stay under budget. Explain the refinements you made.

1. Convert the following decimals to percents.

0.6	0.125
1.35	0.048

2. Convert the following percents into decimals.

48%	7.5%
120%	0.4%

3. Find 25% of 84.

4. Find 18% of 250.

5. What is 150% of 60?

6. What is 0.5 percent of 400?

7. 12 is 20% of what number?

8. 45 is 75% of what number?

9. A jacket costs 120 dollars. It is discounted by 15%.
What is the sale price?

10. A price increases from 80 dollars to 92 dollars.
What is the percent increase?

11. A population decreases from 500 to 425.
What is the percent decrease?

12. Which is greater:
35% of 200 or 60% of 120?

13. Explain why 25%, 0.25, and 1/4 represent the same quantity.
Use a model or example to support your explanation.

14. Without calculating exactly, determine which is greater:
40% of 90 or 30% of 120.
Explain your reasoning.

15. A student says:
"Increasing a number by 20% and then decreasing it by 20% returns the number to its original value."
Do you agree? Explain why or why not.

16. Explain why 150% of a number is greater than the original number.
Use an example to support your explanation.

17. Create a real-life situation where 5% would represent a very large amount.
Explain your reasoning.

18. A store advertises 30% off.
Explain two different ways you could determine the sale price of an item.

19. Without converting to decimals, determine whether 3/8 is greater or less than 40%.
Explain how you know.

20. Describe what 0.5% represents.
Use a visual or numerical example to support your explanation.

1. Write the integers modelled by the counters below, if red counters are negative and yellow counters are positive.

a) 

2. Mark these integers on the number line below:

a) +2
b) -8
c) +9
d) -1

3. Use an integer to represent each situation.

a) 15 m below sea level

b) Lola deposited $35 in her bank account

c) Miku the dog dug a hole 2 m deep

d) A parking spot 3 levels above ground level

e) A drop in price of $1

f) 7 steps backward

4. Order the integers in the following sets from least to greatest.

a) -7, -11, +11, 0, -3

a) +46, -38, -40, -11, +25

5. Name the opposite of each integer.

a) -20

b) 125

c) -7

6. What integer comes next in each of the following number patterns:

a) 3, 2, 1, 0, -1, -2,

b) -6, -4, -2,

c) 10, 7, 4 ,1,

7. Fill in the less than (<) or the greater than (>) symbol to show the relationship between each pair or numbers.

a) 2 ____ 6

b) -4 _____ 5

c) 3 _____ -7

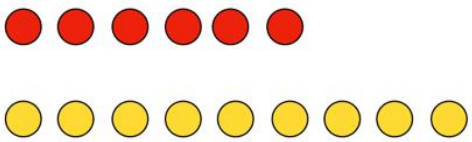
d) -1 _____ 2

8. What is the sum of -2 and +2? Explain your thinking using either a number line or double-sided counters. Use your response to predict the sum of any opposite integers. Explain your thinking.

9. Use double sided counters to find the sum of (+4) and (-2). Use the graphic organizer below to show your thinking.

Draw a picture of the counters that represent +4 and -2.	Combine the counters by organizing them into as many zero pairs as possible.
Draw the counters that are left over. Write the integer that represents these counters.	Complete the addition statement (+4) + (-2) = ___

10. What addition statement does the diagram represent?



11. Use a number line to find the sum of (+9) and (-5). Use the graphic organizer below to show your thinking.

Represent your thinking on the number line.	Complete the addition statement (+9) + (-5) = ____
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10	

12. Find the sum.

a) (-3) + (4)=

b) (+11) + (– 7)=

c) (-5) + (-6)=

d) (-2) + (+1) + (-9)=

13. A magic square is a grid where the sum of each row, column and diagonal is the same. Fill in the missing numbers in the magic square below. Show your thinking and check your work.

4		-3
	0	
-2		5

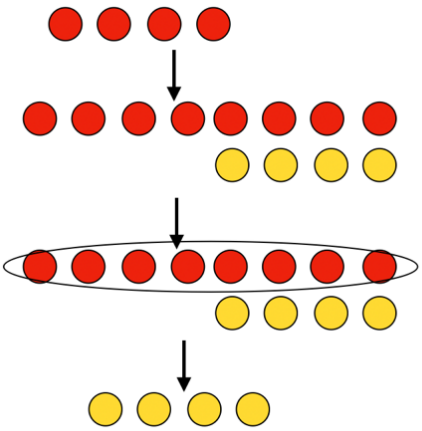
14. Is the puzzle below a magic square? Explain and justify your thinking.

-8	-1	6
3	4	7
-2	9	5

15. Use double sided counters to find the difference, (+3) – (-6). Use the graphic organizer below to show your thinking.

Draw a picture of the counters that represent (+3).	Draw the zero pairs needed to be able to remove (-6).
Remove (-6), and draw the counters that are left over.	Complete the subtraction statement (+3) - (-6) = ____

16. Write the subtraction statement that the diagram represents.



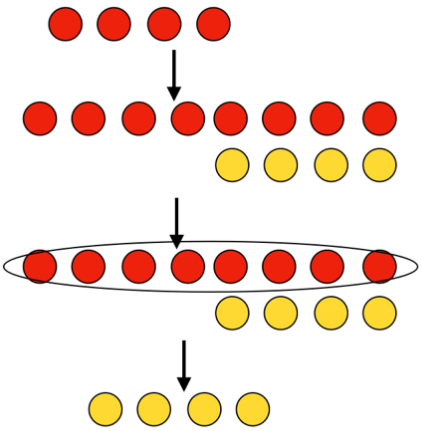
17. Determine the difference using double-sided counters. Show your thinking using picture and numbers.

a) (-5) – (-3) =

b) (+7) – (-5)=

c) (+2) – (+9) =

16. Write the subtraction statement that the diagram represents.



17. Determine the difference using double-sided counters. Show your thinking using picture and numbers.

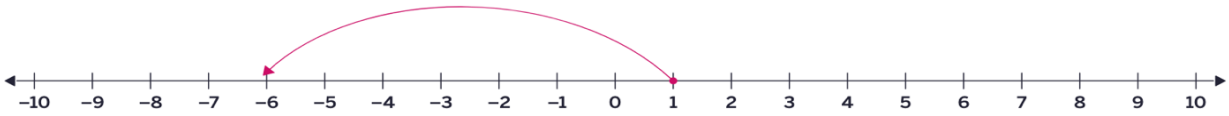
a) (-5) – (-3) =

b) (+7) – (-5)=

c) (+2) – (+9) =

18. Write the subtraction statement that the diagram represents.

a)



b)

c)

19. Find the difference using an open number line. Show your thinking.

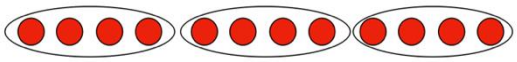
a) (-23) – (+17) =

b) (+122) – (- 46) =

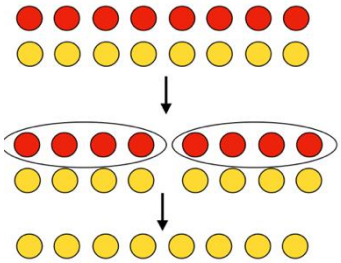
c) (-415) – (-55) =

20. Determine the multiplication statement that the diagram represents.

a)



b)



21. Determine the product using double-sided counters. Use pictures to show your thinking.

a) (+6) x (-7) =

b) (-6) x (-1) =

c) (+5) x (-3) =

22. Write the expression as a multiplication statement.
(-2) + (-2) + (-2) +(-2)

23. Determine the multiplication statement that the diagram represents.

24. Copy and complete the multiplication statement.
(-4) x ☐ = + 12

25. Determine (-15) ÷ (-3) using a number line.

26. Determine each quotient.

a) (-75) ÷ (+25) =

b) (-48) ÷ (-8) =

c) (-324) ÷ (12) =

d) 456 ÷ (-24) =

e) (-672) ÷ (-28) =

27. Which expression equals (-4) x (+6)?

a) (-12) x (-2)
b) (-24) ÷ (-1)
c) (+3) x (+8)
d) (+72) ÷ (-3)

28, Calculate using order of operations.

a) $8 + 3 \times 4 - 6$

b) $(-12 - 5) \times (-3) + (-8)$

c) $20 \div (-4 + 1) + 7$

d) $(-18 \div 3) + (7 \times -2)$

e) $[-6 + (4 \times -3)] \div 2$

29. Complete the statement by including operation symbols to make the statement true.

5 ☐ (-9) ☐ ☐ 4 (-1)= 41

30. Sofia evaluated the expression (-3) x (6-2) +4 to equal -14. What mistake did she make? What is the correct value of the expression?

31. You add two numbers and the answer is negative.
What two numbers might you have added?

32. Would you calculate (-16) – (-4) in the same way you would calculate 16 – (-5)?
Explain your thinking.

33. Predict the sum of any pair of opposite integers. Explain your reasoning using pictures, words, numbers and symbols.

34. Would you rather solve expression, a or b? Explain your reasoning before calculating.

a) (-12 - 4) x (-3) + 8

b) 12 – (4 x (-3) + 8)

35. How are the following expressions the same? How are they different? Which operation changes the outcome the most?

a) (-5 + 8) x 4

b) -5 + (8 x 4)

36. Which one doesn't belong? Share all possible reasons.

a) (6+3) x (-2)
b) 6 + (3 x (-2))
c) (-6 +3) x 2
d) 6 – (3 x 2)

37. Convince Me! Convince me that (10 – 4) x (-3) + 2 will give you a negative answer, without calculating every step. What clues can you use? How does the order of operations help you predict the sign?

38. When you multiply two negative integers and then add a positive integer, the result is always negative. Is this always, sometimes, or never true? Give examples to justify your answer.

1. A soccer tournament had 8 teams. Each team played 3 matches. Each win gives 3 points, a draw gives 1 point, and a loss gives 0 points. If one team won 2 matches and drew 1 math, how many points did they earn?

2. A bookstore sold 15 books on Monday and 12 books on Tuesday. Each book costs $8. The store gave a discount of $20 on the total bill. What was the total amount collected after the discount?

3. A school rented 4 buses for a field trip. Each bus can carry 36 students. There are 128 students going. After filling the buses, how many students will not have a seat?

4. A fruit seller has 120 apples. He packs them into boxes of 8 apples each. Each box sells for $5. If he sells all the boxes, how much money does he make?

5. A charity organization collected $450 at an event. They spent $125 on food and $75 on decorations. The remaining amount was divided equally among 5 families. How much did each family receive?

6. How much colder is -5°C than +3°C?

7. A new freezer is at a room temperature of 20°C. When the freezer is turned on, the temperature inside drops by 6°C per hour. How long does it take the freezer to reach -12°C.

8. Because the charging cable is faulty, Maya's phone battery is charging 15% slower than normal every hour. At 6:00pm, she starts charging her phone, and it shows 50% battery. Normally, her phone would reach 100% in 4 hours. What will her phone's battery percentage be at 10:00pm?

9. Why does it make sense that (-3) – (-9) has to have the same result as (-2) – (-8) or 0 – (-6)?

10. You add the product of two integers to the product of a different two integers and end up with 1. What could you have multiplied and added?