

## Sample Test Questions Grades 7 and 8

Below are sample questions from the TIMSS achievement tests in Science administered to twenty-six countries. TIMSS is a research project sponsored by the International Association for the Evaluation of Educational Achievement (IEA). These questions may be used in the classroom, as a tool for evaluation, or to provide examples of test-question writing. The sample questions are grouped into five categories: 1. [Fractions and Number Sense](#) 2. [Algebra](#) 3. [Measurement](#) 4. [Geometry](#) 5. [Data Representation, Analysis and Probability](#) 6. [Proportionality](#)



### Fractions and Number Sense

- Two groups of tourists each have 60 people. If  $\frac{3}{4}$  of the first group and  $\frac{2}{3}$  of the second group board buses to travel to a museum, how many more people in the first group board buses than in the second group?  
A. 2  
B. 4  
C. 5  
D. 40  
E. 45

Answer: C

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- In a discus-throwing competition, the winning throw was 61.60m. The second place throw was 59.72 m. How much longer was the winning throw than the second-place throw?  
A. 1.18m  
B. 1.88m  
C. 1.98m  
D. 2.18m

Answer: B

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- Write a fraction that is larger than  $\frac{2}{7}$ .

Answer: \_\_\_\_\_

Answer: A fraction with a numerator greater than 2 and a denominator equal to 7.

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4. Divide  $8/35$  by  $4/15$ =

Answer: \_\_\_\_\_

Answer: 33761

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5. Divide: 24.56 by 0.004

A. 0.614

B. 6.14

C. 61.4

D. 614

E. 6140

Answer: E

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6. A chemist mixes 3.75 milliliter of solution A with 5.625 milliliter of solution B to form a new solution. How many milliliter does this new solution contain?

Answer: \_\_\_\_\_

Answer: 9.375

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7. Last year there were 1172 students at Beaton High School. This year there are 15 percent more students than last year. Approximately how many students are at Beaton High School this year?

A. 1800

B. 1600

C. 1500

D. 1400

E. 1200

Answer: D

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8.  $3/4 + 8/3 + 11/8 =$

A.  $22/15$

B.  $43/24$

C.  $91/24$

D.  $115/24$

Answer: D

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9. Which number is five hundred four and seven-tenths?

A. 54.7

B. 504.7

C. 547

D. 5004.7

Answer: B

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10. What is the value of  $2/3 - 1/4 - 1/12$ ?

- A.  $1/16$
- B.  $1/3$
- C.  $3/8$
- D.  $5/12$
- E.  $1/2$

Answer: B

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11. Which is the largest number?

- A.  $4/5$
- B.  $3/4$
- C.  $5/8$
- D.  $7/10$

Answer: A

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12. Multiply:  $0.203$  by  $0.56 =$

Answer: \_\_\_\_\_

Answer: 0.11368

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13. A newspaper reported that about 18 200 trees had been planted in the park. The number was rounded to the nearest hundred. Which of these could have been the actual number planted?

- A. 18 043
- B. 18 189
- C. 18 289
- D. 18 328

Answer: B

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14. In which list of fractions are all of the fractions equivalent?

- A.  $3/4, 6/8, 12/14$
- B.  $3/5, 5/7, 9/15$
- C.  $3/8, 6/16, 12/32$
- D.  $5/10, 10/15, 1/2$

Answer: C

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15. Han had a bag of marbles. She gave half of them to James and then a third of the marbles still in the bag to Pat. She then had 6 marbles left. How many marbles were in the bag to start with?

- A. 18
- B. 24
- C. 30
- D. 36

Answer: A

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16. A car has a fuel tank that holds 35 L of fuel. The car consumes 7.5 L of fuel for each 100 km driven. A trip of 250 km was started with a full tank of fuel. How much fuel remained in the tank at the end of the trip?

- A. 16.25 L
- B. 17.65 L
- C. 18.75 L
- D. 23.75 L

Answer: A

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17. If the price of a can of beans is raised from 60 cents to 75 cents, what is the percentage increase in the price?

- A. 15%
- B. 20%
- C. 25%
- D. 30%

Answer: C

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18. Which of these is 89.0638 rounded to the nearest hundredth?

- A. 100
- B. 90
- C. 89.1
- D. 89.06
- E. 89.064

Answer: D

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19. Luis exercises by running 5 km each day. The course he runs is  $\frac{1}{4}$  km long. How many times through the course does he run each day?

Answer: \_\_\_\_\_

Answer: 20

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20. Mark's garden has 84 rows of cabbages. There are 57 cabbages in each row. Which of these gives the BEST way to estimate how many cabbages there are altogether?

- A. 100 times  $50=5000$

- B. 90 times  $60=5400$
- C. 80 times  $60=4800$
- D. 80 times  $50=4000$

Answer: C

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21. A person's heart is beating 72 times a minute. At this rate, about how many times does it beat in one hour?

- A. 420 000
- B. 42 000
- C. 4 200
- D. 420

Answer: C

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22. Janis, Maija, and their mother were eating a cake. Janis ate  $\frac{1}{2}$  of the cake. Maija ate  $\frac{1}{4}$  of the cake. Their mother ate  $\frac{1}{4}$  of the cake. How much of the cake is left?

- A.  $\frac{3}{4}$
- B.  $\frac{1}{2}$
- C.  $\frac{1}{4}$
- D. None

Answer: D

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23. Write 0.28 as a fraction reduced to its lowest terms.

Answer: \_\_\_\_\_

Answer:  $\frac{7}{25}$

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24. The Smith family uses about 6000 L of water per week. Approximately how many liters of water do they use per year?

- A. 30 000
- B. 240 000
- C. 300 000
- D. 2 400 000
- E. 3 000 000

Answer: C

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25. Which list shows the numbers from smallest to largest?

- A. 0.345, 0.19, 0.8,  $\frac{1}{5}$
- B. 0.19,  $\frac{1}{5}$ , 0.345, 0.8
- C. 0.8, 0.19,  $\frac{1}{5}$ , 0.345
- D.  $\frac{1}{5}$ , 0.8, 0.345, 0.19

Answer: B

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26.  $\frac{3}{4} + (\frac{2}{3} \text{ times } \frac{1}{4}) =$

- A.  $\frac{1}{8}$
- B.  $\frac{5}{16}$
- C.  $\frac{17}{48}$
- D.  $\frac{5}{6}$
- E.  $\frac{11}{12}$

Answer: E

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27. Subtract:  $2.201 - 0.753 =$

- A. 1.448
- B. 1.458
- C. 1.548
- D. 1.558

Answer: A

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28. A stack of 200 identical sheets of paper is 2.5 cm thick. What is the thickness of one sheet of paper?

- A. 0.008 cm
- B. 0.0125 cm
- C. 0.05 cm
- D. 0.08 cm

Answer: B

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29. Subtract:  $6000 - 2369 =$

- A. 4369
- B. 3742
- C. 3631
- D. 3531

Answer: C

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30. Mr. Lewis had \$360. He spent  $\frac{7}{9}$  of it. How much money did he have left?

Answer: \_\_\_\_\_

Answer: 80

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31. Teresa wants to record 5 songs on tape. The length of time each song plays for is shown in the table.

Song	Amount of Time
1	2 minutes 41 seconds
2	3 minutes 10 seconds

3	2 minutes 51 seconds
4	3 minutes
5	3 minutes 32 seconds

ESTIMATE to the nearest minute the total time taken for all five songs to play and explain how this estimate was made.

Estimate: \_\_\_\_\_

Explain:

Answer: 15 minutes, by rounding each amount of time to whole minutes

32. Rounded to the nearest 10 kg the weight of a dolphin was reported as 170 kg. Write down a weight that might have been the actual weight of the dolphin.

Answer:

Answer: A number between 165 and 170.

## Algebra

1. Brad wanted to find three consecutive whole numbers that add up to 81. He wrote the equation  $(n-1)+n+(n+1)=81$ . What does the  $n$  stand for?

- A. The least of the three whole numbers
- B. The middle whole number
- C. The greatest of the three whole numbers
- D. The difference between the least and the greatest of the three whole numbers

Answer: B

2. The numbers in the sequence 2, 7, 12, 17, 22, ...increase by fives. The numbers in the sequence 3, 10, 17, 24, 31,...increase by sevens. The number 17 occurs in both sequences. If the two sequences are continued, what is the next number that will be seen in both sequences?

Answer:

Answer: 52

3. The table represents a relation between  $x$  and  $y$ .

$x$	$y$
1	1
2	?
4	7

What is the missing number in the table?

- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

Answer: B

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4.  $x/2 < 7$  is equivalent to

- A.  $x < 7/2$
- B.  $x < 5$
- C.  $x < 14$
- D.  $x > 5$
- E.  $x > 14$

Answer: C

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5. A rubber ball rebounds to half the height it drops. If the ball is dropped from a rooftop 18m above the ground, what is the total distance traveled by the time it hits the ground the third time?

- A. 31.5 m
- B. 40.5 m
- C. 45 m
- D. 63 m

Answer: C

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6. Find  $x$  if  $10x - 15 = 5x + 20$

Answer: \_\_\_\_\_

Answer: 7

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7. If  $x=2$ , what is the value of  $7x+4$  divided by  $5x-4$ ?

Answer:

Answer: 3

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8. If  $3(x+5)=30$ , then  $x=$

- A. 2
- B. 5



- C. 10
- D. 95

Answer: B

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9. If  $m$  represents a positive number, which of these is equivalent to  $m+m+m+m$ ?
- A.  $m+4$
  - B.  $4m$
  - C.  $m$  to the fourth power
  - D.  $4(m+1)$

Answer: B

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10. Which of these expressions is equivalent to  $y$  to the power of 3?
- A.  $y+y+y$
  - B.  $y$  times  $y$  times  $y$
  - C.  $3y$
  - D.  $y$  squared  $+y$

Answer: B

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11. Juan has 5 fewer hats than Maria, and Clarissa has 3 times as many hats as Juan. If Maria has  $n$  hats, which of these represents the number of hats that Clarissa has?
- A.  $5-3n$
  - B.  $3n$
  - C.  $n-5$
  - D.  $3n-5$
  - E.  $3(n-5)$

Answer: E

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12. Subtract:  $2x/9 - x/9 =$
- A.  $1/9$
  - B. 2
  - C.  $x$
  - D.  $x/9$
  - E.  $x/81$

Answer: D

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13.  $P=LW$ . If  $P=12$  and  $L=3$ , then  $W$  is equal to
- A.  $3/4$
  - B. 3
  - C. 4
  - D. 12
  - E. 36

Answer: C

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14. Which one of the following is FALSE when a, b, and c are different real numbers?

- A.  $(a+b)+c = a+(b+c)$
- B.  $ab=ba$
- C.  $a+b=b+a$
- D.  $(AB)c=a(bc)$
- E.  $AB=BA$

Answer: E

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15. A group of students has a total of 29 pencils and everyone has at least one pencil. Six students have 1 pencil each, 5 students have 3, and the rest have 2. How many students have only 2 pencils?

- A. 4
- B. 6
- C. 8
- D. 9

Answer: A

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16. There are 54 kilograms of apples in two boxes. The second box of apples weighs 12 kilograms more than the first. How many kilograms of apples are in each box? Show your work.

Answer:

Answer: 33 kg and 21 kg.

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## Measurement

1. The number of 750 mL bottles that can be filled from 600 L of water is

- A. 8
- B. 80
- C. 800
- D. 8000

Answer: C

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2. The length of a rectangle is 6 cm, and its perimeter is 16 cm. What is the area of the rectangle in square centimeters?

Answer:

Answer: 12

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3. Four children measured the width of a room by counting how many paces it took them to cross it. The chart shows their measurements.

Name	Number of Paces
Stephen	10
Erlane	8
Ana	9
Carlos	7

Who had the longest pace?

- A. Stephen
- B. Erlane
- C. Ana
- D. Carlos

Answer: D

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4. A cake is put in the oven at 7:20. If the cake takes three quarters of an hour to bake, at what time should it be taken out of the oven?

Answer: \_\_\_\_\_

Answer: 8:05

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5. Which of these is the longest time?

- A. 15 000 seconds
- B. 1 500 minutes
- C. 10 hours
- D. 1 day

Answer: B

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## Geometry

1. A straight line on a graph passes through the points (3,2) and (4,4). Which of these points also lies on the line?

- A. (1,1)
- B. (2,4)
- C. (5,6)
- D. (6,3)
- E. (6,5)

Answer: C

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2. A quadrilateral **MUST** be a parallelogram if it has
- A. one pair of adjacent sides equal
  - B. one pair of parallel sides
  - C. a diagonal as axis of symmetry
  - D. two adjacent angles equal
  - E. two pairs of parallel sides

Answer: E

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3. In a quadrilateral, two of the angles each have a measure of 110 degrees, and the measure of the third angle is 90 degrees. What is the measure of the remaining angle?
- A. 50 degrees
  - B. 90 degrees
  - C. 130 degrees
  - D. 140 degrees
  - E. None of the above

Answer: A

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4. What is the ratio of the length of a side of a square to its perimeter?
- A.  $1/1$
  - B.  $1/2$
  - C.  $1/3$
  - D.  $1/4$

Answer: D

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## **Data Representation, Analysis, and Probability**

1. In a bag of cards  $1/6$  are green,  $1/12$  are yellow,  $1/2$  are white and  $1/4$  are blue. If someone takes a card from the bag without looking, which color will it most likely be?
- A. White
  - B. Blue
  - C. Green
  - D. Yellow

Answer: A

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2. A drawer contains 28 pens; some white, some blue, some red, and some gray. If the probability of selecting a blue pen is  $2/7$ , how many blue pens are in the drawer?
- A. 4
  - B. 6
  - C. 8
  - D. 10

E. 20

Answer: C

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3. This chart shows temperature readings made at different times on four days.

	6 a.m.	9 a.m.	Noon	3 p.m.	8 p.m.
Monday	15 degrees	17 degrees	20 degrees	21 degrees	19 degrees
Tuesday	15 degrees	15 degrees	15 degrees	10 degrees	9 degrees
Wednesday	8 degrees	10 degrees	14 degrees	13 degrees	15 degrees
Thursday	8 degrees	11 degrees	14 degrees	17 degrees	20 degrees

When was the highest temperature recorded?

- A. Noon on Monday
- B. 3 p.m. on Monday
- C. Noon on Tuesday
- D. 3 p.m. on Wednesday

Answer: B

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4. Each of the six faces of a certain cube is painted either red or blue. When the cube is tossed, the probability of the cube landing with a red face up is  $\frac{2}{3}$ . How many faces are red?

- A. One
- B. Two
- C. Three
- D. Four
- E. Five

Answer: D

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## Proportionality

1. The table shows the values of  $x$  and  $y$  where  $x$  is proportional to  $y$ .

$x$	3	6	P
$y$	7	Q	35

What are the values of P and Q?

- A. P=14 and Q=31
- B. P=10 and Q=14
- C. P=10 and Q=31
- D. P=14 and Q=15
- E. P=15 and Q=14

Answer: E

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2. A class has 28 students. The ratio of girls to boys is 4:3. How many girls are in the class?

Answer: \_\_\_\_\_

Answer: 16

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3. Three-fifths of the students in a class are girls. If 5 girls and 5 boys are added to the class, which statement is true of the class?

- A. There are more girls than boys.
- B. There are the same number of girls as there are boys.
- C. There are more boys than girls.
- D. You cannot tell whether there are more girls or boys from the information given.

Answer: A

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4. Peter bought 70 items and Sue bought 90 items. Each item costs the same and the items cost \$800 altogether. How much did Sue pay?

Answer: Sue paid \_\_\_\_\_

Answer: 450

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5. To mix a certain color of paint, Alana combines 5 liters of red paint, 2 liters of blue paint, and 2 liters of yellow paint. What is the ratio of red paint to the total amount of paint?

- A.  $\frac{5}{2}$
- B.  $\frac{9}{4}$
- C.  $\frac{5}{4}$
- D.  $\frac{5}{9}$

Answer: D