Rational Numbers on the Number Line

To place p/q, cut each unit into q equal parts and count p parts from 0: right for positive, left for negative.

Name: Date: Score: ____ / 18

A. Fill in the blanks

1. To mark 3/4, divide each unit into ____ equal parts.

2. The numerator tells how many ____ to count from 0.

3. Negative rationals lie to the ____ of 0.

4. A rational number between a and b is (a + b) ÷ ____.

B. True or False

5. −2/3 lies between −1 and 0. True / False

6. There is no rational number between 1/2 and 3/4. True / False

7. To mark 7/4 we count 7 quarter-parts from 0. True / False

8. Positive rationals are marked to the left of zero. True / False

C. Assertion and reason

9. Assertion (A): There are infinitely many rationals between 0 and 1.
Reason (R): The average of two rationals is a rational between them.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

10. Assertion (A): −3/4 lies to the right of 0.
Reason (R): −3/4 is negative.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

D. Choose the correct option

11. To mark 5/3, each unit is divided into:

(a) 5 parts
(b) 3 parts
(c) 8 parts
(d) 15 parts

Answer: _____

12. A rational number between 1/3 and 1/2:

(a) 5/12
(b) 1/4
(c) 2/3
(d) 1

Answer: _____

13. −7/4 lies between:

(a) 0 and 1 (b) −1 and −2

(c) 1 and 2 (d) −2 and −3

Answer: _____

14. How many rationals lie between 0 and 1?

(a) none (b) one

(c) ten (d) infinitely many

Answer: _____

E. Numerical problems

15. Find two rational numbers between 1/4 and 1/2 by averaging.

F. Short answer questions

16. Explain how to mark −5/4 on the number line.

17. Find three rational numbers between 1/2 and 1.

G. Match the columns

18. Match each item in Column A with the correct item in Column B.

Column A	Column B	Your answer
1. Denominator	(a) Count to the left	1 → ____
2. Numerator	(b) Number of equal parts per unit	2 → ____
3. Negative sign	(c) Parts counted from 0	3 → ____
4. (a + b)/2	(d) A rational between a and b	4 → ____

Detailed solutions

1. 4

2. parts

3. left

4. 2

5. True. It is negative and less than 1 in size.

6. False. For example 5/8 lies between them.

7. True. 7 parts of size 1/4.

8. False. They go to the right.

9. (a) Averaging can be repeated forever.

10. (d) A is false; R is true.

11. (b) 3 parts. The denominator.

12. (a) 5/12. Their average is 5/12.

13. (b) −1 and −2. −1.75.

14. (d) infinitely many. We can always find another by averaging.

15. (1/4 + 1/2) ÷ 2 = 3/8; (1/4 + 3/8) ÷ 2 = 5/16; Check: 1/4 = 4/16 < 5/16 < 6/16 = 3/8 < 1/2. **Answer: 3/8 and 5/16**

16. Divide each unit into 4 equal parts; from 0 count 5 parts to the left. That point is −5/4 (between −1 and −2).

17. Average: 3/4; then between 1/2 and 3/4: 5/8; between 3/4 and 1: 7/8.

18. 1 → (b), 2 → (c), 3 → (a), 4 → (d). The number line places every rational exactly.