Unit 3 – Rational Numbers

Grade 9 Mathematics
Exam Review

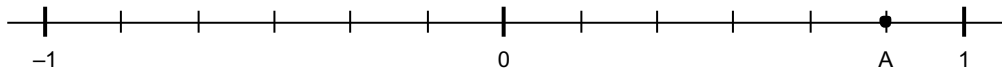
1. Which numbers are rational numbers?
$\frac{5}{13}$, 3.6, 0.8, $\frac{13}{5}$

2. Which numbers are rational numbers?
-5.3, $\frac{8}{7}$, 14, $-\frac{1}{8}$

3. Identify the number that is NOT equal to the other three numbers.
$\frac{-2}{3}$, $\frac{2}{-3}$, $\frac{-2}{-3}$, $-\frac{2}{3}$

4. Identify equal rational numbers in this list:
$\frac{-7}{-8}$, $\frac{-7}{8}$, $-\frac{8}{7}$, $\frac{7}{-8}$, $-\frac{7}{8}$

5. Which rational number is represented by the letter A on the number line?



6. Identify the greatest rational number.
$-\frac{9}{14}$, $\frac{5}{7}$, $-\frac{3}{4}$, $\frac{5}{8}$

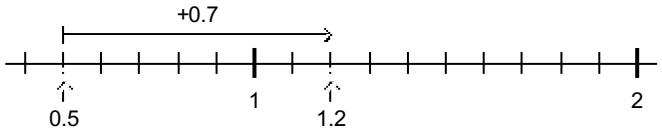
7. Order the numbers from least to greatest.
-0.5, $-0.\overline{5}$, -0.55

8. Which of these numbers are between -2.4 and -3.9?
-4.05, -2.95, -3.95, -3.35

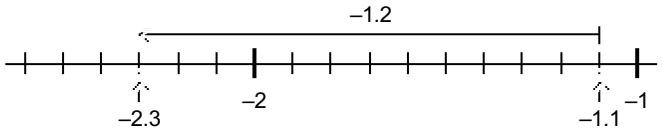
9. Which of these numbers are between $\frac{4}{6}$ and $\frac{7}{5}$?

$\frac{5}{6}$, $\frac{1}{5}$, $\frac{7}{8}$, $\frac{4}{5}$

10. Write the addition statement that this number line represents.



11. Write the addition statement that this number line represents.



12. Determine this sum.
$(-2.9)+(-5.9)$

13. Estimate to determine which sum is greater than 0.
i) $5.1+(-7.7)$
ii) $-1.1+(-1.6)$
iii) $-3.3+3.7$
iv) $-3.6+2.8$

14. Which expression has the same sum as $-\frac{3}{4}+\frac{7}{8}$?

i) $-\frac{7}{8}+\left(-\frac{3}{4}\right)$

ii) $\frac{7}{8}+\left(-\frac{3}{4}\right)$

iii) $\frac{3}{4}+\left(-\frac{7}{8}\right)$

iv) $\frac{7}{8}+\frac{3}{4}$

15. Determine this sum.
$\frac{12}{5}+\left(-\frac{11}{10}\right)$

16. A student first borrowed $46.25, then borrowed another $17.75 from his father. He then paid back $19.75. How much does he still owe his father?

17. Which numbers below would make this sentence true?
$-5.3+\square \le -1.3$
i) 4
ii) 5
iii) 3.6
iv) 4.3

18. Which expression has the least sum?
i) $9.76+6.05$
ii) $-9.76+6.05$
iii) $9.76+(-6.05)$
iv) $-9.76+(-6.05)$

19. Yesterday, the temperature of a freezer was $-5.9°C$. When the technician checked the freezer today, its temperature had decreased by $9.3°C$. Determine the temperature of the freezer today.

20. Determine this difference.
$2.8 - (-6.6)$

21. Determine this difference.
$\frac{20}{7} - \left(-\frac{16}{7}\right)$

22. Which expression has the same answer as $-\frac{3}{4} - \left(-\frac{7}{8}\right)$?

i) $-\frac{3}{4} - \frac{7}{8}$

ii) $\frac{3}{4} + \frac{7}{8}$

iii) $-\frac{3}{4} + \frac{7}{8}$

iv) $\frac{3}{4} - \left(-\frac{7}{8}\right)$

23. Which expressions have the same answer as $-17.3 - (-8.8)$?

i) $8.8 - 17.3$

ii) $8.8 + 17.3$

iii) $-17.3 + 8.8$

iv) $-8.8 - 17.3$

24. Which expressions have the same answer as $-5\frac{2}{3}$ - (-17) ?

i) $17 + 5\frac{2}{3}$

ii) $-17 + 5\frac{2}{3}$

iii) $-5\frac{2}{3} + 17$

iv) $17 - 5\frac{2}{3}$

25. Determine this difference.
$8.46 - (-3.61)$

26. Determine this difference.
$-\frac{11}{5} - \left(-\frac{7}{10}\right)$

27. Determine this difference.
$-\frac{8}{5} - \frac{5}{2}$

28. Determine this difference.
$3\frac{1}{5} - -4\frac{1}{3}$

29. The temperature at the top of a mountain is 9.9°C less than the temperature at the base of the mountain. If the temperature at the base is -4.7°C, what is the temperature at the top?

30. Determine this product.
$(-2) \times 3.6$

31. Determine this product.
$-4 \times \frac{2}{7}$

32. Which products are less than 0?
i) $(-0.8) \times (1.3)$
ii) $(-2.3) \times (-1.6)$
iii) $(-1.3) \times (-0.5)$
iv) $(1.5) \times (-1.6)$

33. Which products are less than 0?
i) $\left(\frac{-8}{9}\right) \times \left(\frac{6}{7}\right)$
ii) $\left(\frac{8}{9}\right) \times \left(\frac{6}{-7}\right)$
iii) $\left(\frac{-8}{9}\right) \times \left(\frac{6}{-7}\right)$
iv) $\left(-\frac{8}{9}\right) \times \left(\frac{6}{7}\right)$

34. Which expressions have the same product as $(-5.2) \times (2.4)$?
i) $(-3.2) \times (-3.9)$
ii) $-(2.6) \times (4.8)$
iii) $(1.6) \times (-7.8)$
iv) $(-1.2) \times (-10.4)$
v) $(2.4) \times (-5.2)$

35. Determine this product.
$(-4.8)(2.45)$

36. Determine this product.
$-\frac{5}{6} \times -\frac{3}{2}$

37. Determine this product.
$-4\frac{1}{2} \times 4\frac{1}{4}$

38. The price of a share changed by -$1.45. A person owns 180 shares.
By how much did his shares change in value?

39. A submersible descends at an average rate of 6.5 m/min.
Express the depth below the surface after 4.4 min as a rational number.

40. Which quotients are less than 0?

i) $\left(\frac{-7}{8}\right) \div \left(\frac{9}{-8}\right)$

ii) $\left(-\frac{7}{8}\right) \div \left(\frac{9}{8}\right)$

iii) $\left(\frac{-7}{-8}\right) \div \left(\frac{-9}{8}\right)$

iv) $\left(-\frac{7}{8}\right) \div \left(-\frac{9}{8}\right)$

41. Determine this quotient.
$(-5.4) \div 2$

42. Determine this quotient.
$\frac{3}{5} \div -\frac{7}{10}$

43. Determine this quotient.
$\frac{2}{3} \div \frac{5}{2}$

44. Which expressions have the same answer as $(-0.51) \div 0.62$?

i) $5.1 \div (-6.2)$

ii) $(-51) \div (6.2)$

iii) $51 \div (-0.062)$

iv) $0.0051 \div (-0.0062)$

45. Determine this quotient.
$1.15 \div (-2.3)$

46. Use a calculator to determine this quotient.
$(-11.7375) \div 3.13$

47. Determine this quotient.
$\frac{3}{10} \div -\frac{9}{4}$

48. Determine this quotient.
$-1\frac{1}{3} \div \frac{5}{8}$

49. At a harbour, the effect of the tide changed the water level by 12.1 m in 5.5 h.
What was the mean change in water level per hour?

50. Which quotients are less than -1?

i) $\left(-\frac{1}{6}\right) \div \frac{1}{5}$

ii) $\left(-\frac{1}{5}\right) \div \frac{1}{6}$

iii) $\frac{1}{6} \div \left(-\frac{1}{5}\right)$

iv) $\frac{1}{5} \div \left(-\frac{1}{6}\right)$

51. Evaluate.

$3.4 - (-1.3) \times (0.8)$

52. Evaluate.

$(-0.7) \times (4.6) - (1.3)$

53. Which operation would you do first to evaluate this expression?

$8.2 - 1.5 \div 0.2 \times 2.1 + 3.6$

54. Evaluate.

$\frac{5}{6} \div \left(\frac{4}{5} + \frac{1}{10}\right)$

55. Evaluate.

$\frac{8}{9} - \frac{2}{3} \times \frac{3}{4} + \frac{5}{9}$

56. Evaluate.

$5.2 \times 2.7 - 1.7 \times 0.6$

57. Evaluate.

$\frac{6 \times 9 - 5}{4 + 3 \times 5}$

58. Which expression has the greatest value?

i) $9.5 - 2.5 \times (-1.4)^2$

ii) $9.5 - [2.5 \times (-1.4)^2]$

iii) $(9.5 - 2.5) \times (-1.4)^2$

iv) $9.5 \times (-2.5) \times (-1.4)^2$

59. The formula $F = \frac{9}{5} \times C + 32$ can be used to convert Celsius temperature to Fahrenheit.

Convert -20°C to Fahrenheit.

60. A student has $1113 in her savings account. She withdraws $75 each week.
A formula for calculating the amount of money remaining in her account is $A = T - 75w$, where T dollars is the original amount and w is the number of weeks she has been withdrawing money.
Determine the amount of money remaining in her account after 14 weeks.

Unit 3 - Answer Key

1. All of them

2. All of them

3. $\frac{-2}{-3}$

4. $\frac{-7}{8}$, $\frac{7}{-8}$, and $-\frac{7}{8}$

5. $\frac{5}{6}$

6. $\frac{5}{7}$

7. $-0.\bar{5}$, -0.55, -0.5

8. -2.95 and -3.35

9. $\frac{5}{6}$, $\frac{7}{8}$, and $\frac{4}{5}$

10. $0.5 + 0.7 = 1.2$

11. $-1.1 + (-1.2) = -2.3$

12. -8.8

13. iii

14. ii

15. $\frac{13}{10}$

16. $44.25

17. i and iii

18. iv

19. −15.2°C

20. 9.4

21. $\frac{36}{7}$

22. iii

23. i and iii

24. iii and iv

25. 12.07

26. $-\frac{3}{2}$

27. $-\frac{41}{10}$

28. $7\frac{8}{15}$

29. -14.6°C

30. –7.2

31. $-\frac{8}{7}$

32. i and iv

33. i, ii, and iv

34. ii, iii, and v

35. –11.76

36. $\frac{5}{4}$

37. $-19\frac{1}{8}$

38. -$261.00

39. -28.6 m

40. ii and iii

41. –2.7

42. $-\frac{6}{7}$

43. $\frac{4}{15}$

44. i and iv

45. –0.5

46. –3.75

47. $-\frac{2}{15}$

48. $-2\frac{2}{15}$

49. -2.2 m/h

50. ii and iv

51. 4.44

52. -4.52

53. Divide 1.5 by 0.2.

54. $\frac{25}{27}$

55. $\frac{17}{18}$

56. 13.02

57. $\frac{49}{19}$

58. iii

59. –4°F

60. $63