Answer Key.
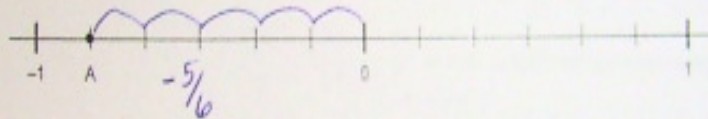
1. Which numbers are rational numbers?

   $-5.4, \dfrac{7}{6}, 11, -\dfrac{1}{4}$

2. Identify the number that is NOT equal to the other three numbers.

   $\dfrac{-5}{8}, \dfrac{5}{-8}, \boxed{\dfrac{-5}{-8}}, -\dfrac{5}{8}$

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

   $-\dfrac{5}{6}$

4. Order the numbers from least to greatest.

   $-0.4, -0.\overline{4}, -0.44$

5. Which of these numbers are between -2.4 and -3.9?

   $-4.05, -2.95, -3.95, -3.35$

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

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

7. Determine this sum.

   $(-2.5) + (-6.1)$

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

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

7. Determine this sum.

$(-2.5) + (-6.1)$

8. Estimate to determine which sum is greater than 0.

i) $5.8 + (-7.7)$

ii) $-1.1 + (-1.8)$

iii) $-3.3 + 3.6$

iv) $-3.6 + 2.8$

9. Determine this sum.

$$\frac{14}{7} + \left(-\frac{15}{14}\right)$$

10. A student first borrowed $40.25, then borrowed another $15.75 from his father. He then paid back $20.75. How much does he still owe his father?

11. Which expression has the least sum?

i) $9.43 + 6.05$

ii) $-9.43 + 6.05$

iii) $9.43 + (-6.05)$

iv) $-9.43 + (-6.05)$

_____ 12. Yesterday, the temperature of a freezer was -18.1. When the technician checked the freezer today, its temperature had decreased by 11.2 Determine the temperature of the freezer today.

_____ 13. Determine this difference.

$$\frac{18}{7} - \left(-\frac{5}{7}\right)$$

a. $\frac{23}{7}$ b. $-\frac{13}{7}$ c. $-\frac{23}{7}$ d. $\frac{13}{7}$

_____ 14. 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) $\frac{3}{4} - \left(-\frac{7}{8}\right)$

a. ii   b. i   c. iv   d. iii

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

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

  a. ii   b. i   c. iv   d. iii

____ 15. Determine this difference.

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

____ 16. The temperature at the top of a mountain is 10.5°C less than the temperature at the base of the mountain. If the temperature at the base is −4.4°C, what is the temperature at the top?

____ 17. Determine this product.

$$\frac{4}{9} \times (-6)$$

____ 18. Which products are less than 0?
i) $(-0.6) \times (1.1)$
ii) $(-2.3) \times (-1.8)$
iii) $(-1.2) \times (-0.7)$
iv) $(1.5) \times (-1.8)$

____ 19. Determine this product.

$$\left(-\frac{3}{2}\right)\left(-\frac{5}{4}\right)$$

22. $-\frac{10}{3} - \frac{13}{9}$

23. $\left(3\frac{1}{2}\right)\left(-3\frac{2}{3}\right)$

24. $\left(-\frac{4}{3}\right) \div \left(-\frac{5}{3}\right)$

25. $6.4 - 3.8 \div 2.4 \times 4.1$

26. $\frac{2}{3} - \left(-\frac{7}{12}\right)\left(-\frac{4}{21}\right)$

_____ 17. Determine this product.

$$\frac{4}{9} \times (-6)$$

_____ 18. Which products are less than 0?
   i) $(-0.6) \times (1.1)$
   ii) $(-2.3) \times (-1.8)$
   iii) $(-1.2) \times (-0.7)$
   iv) $(1.5) \times (-1.8)$

_____ 19. Determine this product.

$$\left(-\frac{3}{2}\right)\left(-\frac{5}{4}\right)$$

_____ 20. Determine this quotient.
   $(-2.8) \div 4$

21. $-4\frac{3}{4} + \left(-1\frac{3}{5}\right)$

22. $-\frac{10}{3} - \frac{13}{9}$

23. $\left(3\frac{1}{2}\right)\left(-3\frac{2}{3}\right)$

24. $\left(-\frac{4}{3}\right) \div \left(-\frac{5}{3}\right)$

25. $6.4 - 3.8 \div 2.4 \times 4.1$

26. $\frac{2}{3} - \left(-\frac{7}{12}\right)\left(-\frac{4}{21}\right)$

27. $\left[\frac{8}{9} \times \left(-\frac{5}{12}\right)\right] \div \left(-\frac{4}{9}\right)$

28. $-2\frac{3}{4} - \left(-4\frac{1}{3}\right) - 2\frac{5}{6}$

1. All Rational Numbers.

2.

4. -0.4
$-0.444...$
-0.44

Least

$-0.444...$
-0.44
-0.4

Greatest.

"Closest to zero"

5. -2.4

-2.95
-3.35
-3.9
-3.95
-4.05

6. $\dfrac{4}{6}$

$\dfrac{7}{5}$

$0.\overline{6}$

1.4

$\dfrac{5}{6} = 0.8\overline{3}$ ✓

$\dfrac{1}{5} = 0.2$ ✗

$\dfrac{7}{8} = 0.875$ ✓

$\dfrac{4}{5} = 0.8$ ✓

7. $(-2.5) + (-6.1)$

-8.6

8. $5.8 + (-7.7) =$ —

$-1.1 + (-1.8) =$ —

$-3.3 + 3.6 = +$

$-3.6 + 2.8 =$ —

9. $\dfrac{14}{7} + \left(-\dfrac{15}{14}\right)$

$\dfrac{28}{14} + \left(\dfrac{-15}{14}\right)$

$\dfrac{13}{14}$

10. $-40.25 - 15.75 + 20.75$

$$-35.25$$

11. $9.43 + 6.05$
$-9.43 + 6.05$
$9.43 + -6.05$
$-9.43 + -6.05 = -15.48$ (least)

12. $-18, 1$
    $-11, 2$
    $-29, 3$

13. $\dfrac{23}{7}$

14.

15. $\dfrac{-3}{4} - \dfrac{7}{8}$

    $\dfrac{-6}{8} - \dfrac{7}{8}$

    $\dfrac{-13}{8}$

16. $-4.4 - 10.5$

-14.9

17. $\dfrac{4}{\cancelto{3}{9}} \times \dfrac{(-6)^{-2}}{1}$

$\dfrac{-8}{3}$

18. i)   −   less than zero

     ii)   +

     iii)   +

     iv)   −   less than zero.

19. $\left(-\dfrac{3}{2}\right)\left(-\dfrac{5}{4}\right)$

       $+^{15}/_{8}$

20. $(-2.8) \div 4$

       -0.7

21. $-4\frac{3}{4} + -1\frac{3}{5}$

$-\frac{19}{4} + -\frac{8}{5}$

$\frac{-95}{20} + \frac{-32}{20}$

$\frac{-127}{20}$

$-6\frac{7}{20}$

22. $\dfrac{-10^{\cdot 3}}{3 \cdot 3} - \dfrac{13}{9}$

$\dfrac{-30}{9} - \dfrac{13}{9}$

$\dfrac{-43}{9}$

$-4\dfrac{7}{9}$

25. $6.4 - 3.8 \div 2.4 \times 4.1$

$6.4 - 1.58 \times 4.1$

$6.4 - 6.5$

-0.1

26. $\dfrac{2}{3} - \left(\dfrac{-7}{12}\right)\left(\dfrac{-4}{21}\right)$

$+\dfrac{2}{3} - \left(\dfrac{+1}{9}\right)$

$+\dfrac{6}{9} - \left(\dfrac{1}{9}\right)$

$+\dfrac{5}{9}$

23 $\left(3\frac{1}{2}\right)\left(-3\frac{2}{3}\right)$

$\left(\frac{7}{2}\right)\left(\frac{-11}{3}\right)$

$\frac{-77}{6}$

$-12\frac{5}{6}$

24. $\left(\frac{-4}{3}\right) \div \left(\frac{-5}{3}\right)$

$\frac{-4}{3} \times \frac{-3^{-1}}{5}$

$\frac{4}{5}$

27. $\left[\dfrac{\overset{2}{\cancel{8}}}{9} \times \left(\dfrac{-5}{\underset{3}{\cancel{12}}}\right)\right] \div \left[\dfrac{-4}{9}\right]$

$\dfrac{-10}{27}$ $\div$ $\dfrac{-4}{9}$

$\dfrac{\overset{-5}{\cancel{-10}}}{\underset{3}{\cancel{27}}}$ $\times$ $\dfrac{\overset{-1}{\cancel{-9}}}{\underset{2}{\cancel{4}}}$

$\dfrac{+5}{6}$

28. $-2\frac{3}{4} - {}^-4\frac{1}{3} - 2\frac{5}{6}$

$-\frac{11 \cdot 3}{4 \cdot 3} - \quad -\frac{13 \cdot 4}{3 \cdot 4} - \frac{17 \cdot 2}{6 \cdot 2}$

$\frac{-33}{12} - \quad \frac{-52}{12} - \frac{34}{12}$

$\frac{19}{12} \quad - \frac{34}{12}$

$\frac{-15}{12}$

$-1\,{}^{3}/_{12}$

$-1\;{}^{1}/_{4}$