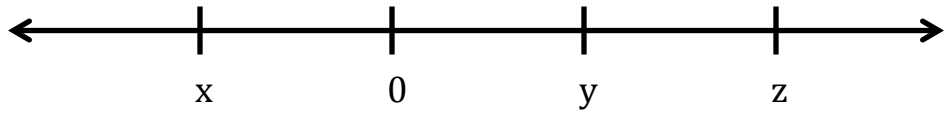
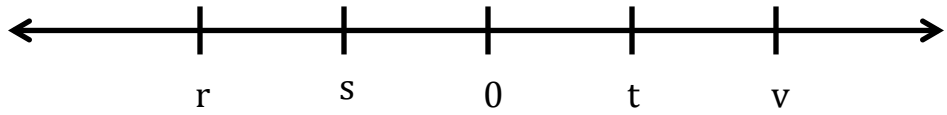
1. How many integers are there between the decimal and the first even digit after the decimal 0.0000312567? **[0]**

2. If x is a non-positive integer than which of the following is not the value of x+5? Mark all that apply.
   a) 0
   b) -5
   c) 5
   d) 6
   e) 3.5

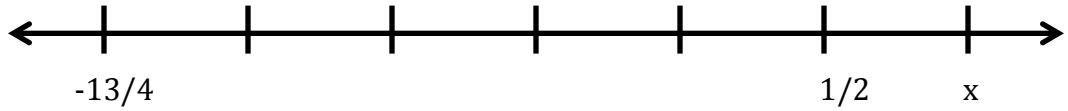
3. Which of the following numbers is farthest from the number 1 on the number line?
   a) -10
   b) -5
   c) 0
   d) 5
   e) 10



4. On the number line shown above, the tick marks are equally spaced. Which of the following statements about the numbers **x**, **y**, and **z** must be true? Indicate all such statements.
   a) $xyz < 0$
   b) $x + z = y$
   c) $z(y - x) > 0$

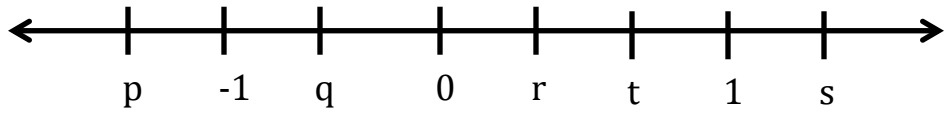


5. Which of the following MUST be true?
   a) $v > s + t$
   b) $v + s > t + r$
   c) $rs > v$

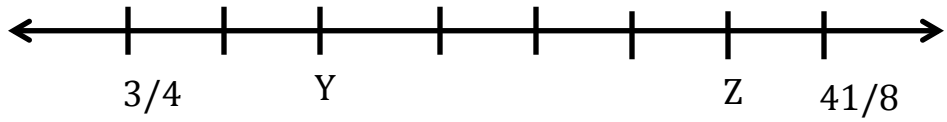


6. Assuming that the number line above has equal spaces. What is the value of point x? **[5/4]**
7. On a line, E is the midpoint of $\overline{DF}$, and $\overline{DE}$ has a length of 6. Point G does not lie on the line and $\overline{EG}$=4. What is the range of possible values of $\overline{FG}$? **[2-10 exclusive]**
8. X, Y and Z all lie on a number line. $\overline{XY}$ has length of 5 and $\overline{YZ}$ has a length of 7. If point U is the midpoint of $\overline{XZ}$, and $\overline{UZ} > 2$, what is the length of $\overline{UZ}$? **[6]**

For questions 9-14, refer to the number line below. Decide whether each statement MUST be true, COULD be or will NEVER be true.



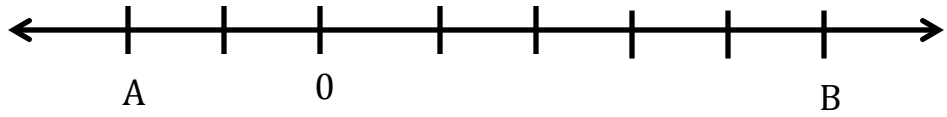
9. $s + q > 0$ **Must be true**
10. $pq > t$ **Could be true**
11. $p^2 > s^4$ **Could be true**
12. $s - p > r - q$ **Must be true**
13. $t - q = 2$ **Never be true**
14. $rs > 1$ **Could be true**



15. If the tick marks on the number line above are evenly spaced, what is the distance between Y and Z?
2.5

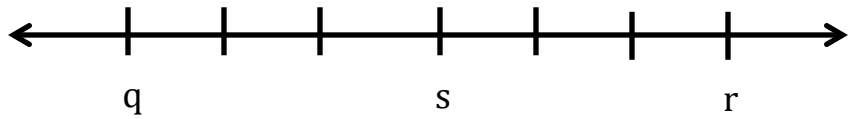
16. A, B and C all lie on a line. D is the midpoint of AB and E is the midpoint of BC. AB=4 and BC=10. Which of the following could be the length of AE.

a) 1
b) 2
c) 3
d) 4
e) 5



17. Refer to the number line above.
Quantity A: AB
Quantity B: -1

a) Quantity A is greater.
b) Quantity B is greater.
c) The two quantities are equal.
d) The relationship cannot be determined from the information given.



18. s is the midpoint of $\overline{qr}$ and r=-2q
Quantity A: s
Quantity B: 0

a) Quantity A is greater.
b) Quantity B is greater.
c) The two quantities are equal.
d) The relationship cannot be determined from the information given.

19. A, B, C and D all lie on the same number line. C is the midpoint of $\overline{AB}$ and D is the midpoint of $\overline{AC}$.

Quantity A: The ratio of $\overline{AD}$ to $\overline{CB}$
Quantity B: The ratio of $\overline{AC}$ to $\overline{AB}$

a) Quantity A is greater.
b) Quantity B is greater.
c) The two quantities are equal.
d) The relationship cannot be determined from the information given.

Number Operations Exercise A

1. $5 + (2\times4 + 2)^2 - |17(-4)| + 18 \div 3\times5 - 8$ **[59]**
2. $5x - [y - (3x - 4y)]$ **[8x-5y]**
3. $2 \div 2 \div 2 \div 2 \div 2 \div 2$ **[1/16]**
4. $2\times2 \div 2 \div 2\times2 - 3 + 1 - 3(4 \div 2 - 2)$ **[0]**
5. $2 - (2[1 - 1] - 3) + 5$ **[10]**
6. $(4 + 12 \div 3 - 18) - [-11 - 4]$ **[5]**
7. Which of the parentheses in the following expressions are unnecessary and could thus be removed without any change in the value of the expression?
   a. $-(5^2) - (12 - 7)$
   b. $(x + y) - (w + z) - (a\times b)$
8. Evaluate $-|-13 - (-17)|$ **[-4]**
9. $\left[\frac{4+8}{2-6}\right] - [4 + 8 \div 2 - (-6)]$ **[-17]**
10. Simplify: $x - (3 - x)$ [2x-3]
11. Simplify: $(4 - y) - 2(2y - 3)$ [10-5y]
12. Solve for x: $2(2 - 3x) - 4(4 + x) = 7$ [-1.9]
13. Solve for x: $x\left(x - \frac{5x+6}{x}\right) = 0$ **[6,-1]**
14. Solve for z: $\frac{4z-7}{3-2z} = -5$ [4/3]

Number Operations Exercise B

1. Evaluate the following.

(a) $15 - (6 - 4)(-2)$
(b) $(2 - 17) \div 5$
(c) $(60 \div 12) - (-7 + 4)$
(d) $(3)^4 - (-2)^3$
(e) $(-5)(-3) - 15$
(f) $(-2)^4(15 - 18)^4$
(g) $(20 \div 5)^2(-2 + 6)^3$
(h) $(-85)(0) - (-17)(3)$

2. Evaluate the following.

(a) $\frac{1}{2} - \frac{1}{3} + \frac{1}{12}$
(b) $\left(\frac{3}{4} + \frac{1}{7}\right)\left(\frac{-2}{5}\right)$
(c) $\left(\frac{7}{8} - \frac{4}{5}\right)^2$
(d) $\left(\frac{3}{-8}\right) \div \left(\frac{27}{32}\right)$

Answers Number Operations Exercise B

1)
a) 19
b) -3
c) 8
d) 89
e) 0
f) 1296
g) 1024
h) 51

2)
a) ¼
b) -5/14
c) 9/1600
d) -4/9

Number Operations Exercise C

1. $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} =$
2. $\frac{12}{25} + \frac{13}{5} =$
3. $\frac{6}{21} + \frac{7}{3} =$
4. $\frac{1}{16} - \frac{3}{4} + 1\frac{7}{8} =$
5. $4\left(\frac{1}{3} + \frac{1}{12}\right)$
6. $\frac{1}{2}\left(\frac{1}{3} + \frac{1}{4}\right) =$
7. $\frac{1}{24}(36 + 60) =$
8. $0.021 + 0.946 + 1.324 =$
9. $\left(\frac{12}{16} - \frac{3}{6}\right)^2 =$
10. $1.69 \times 0.002 =$
11. $30.17 \times 1.01 =$
12. $7 + 5 \times \left(\frac{1}{4}\right)^2 - 6 \div (2 - 3) =$
13. $4(1.24 - (0.8)^2) + 6 \times \frac{1}{3} =$
14. $\dfrac{\frac{5}{6} + \frac{3}{2} + 2}{\frac{1}{3} + \frac{4}{9} + 4} =$
15. $\dfrac{0.25 \times (0.1)^2}{0.5 \times 40} =$

ANSWER KEY—NUMBER OPERATIONS EXERCISE

1. $\frac{13}{12}$ or $1\frac{1}{12}$
2. $\frac{77}{25}$ or $3\frac{2}{25}$
3. $\frac{55}{21}$ or $2\frac{13}{21}$
4. $\frac{19}{16}$ or $1\frac{3}{16}$
5. $\frac{5}{3}$ or $1\frac{2}{3}$
6. $\frac{7}{24}$
7. 4
8. 2.291
9. $\frac{1}{16}$
10. 0.00338
11. 30.4717
12. $13\frac{5}{16}$
13. 4.4
14. $\frac{39}{43}$
15. 0.000125