

TABE
MATH-D

Unit 1

NUMBERS

Answer Keys

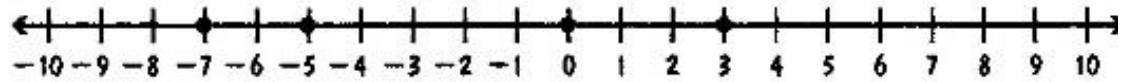
Lessons: 1-10

Revised: October 24, 2023

Math-D - Lesson-1

page-1 Positive and Negative Numbers

1. D. The opposite of each number is a number with the same digits but a different sign, as represented below.



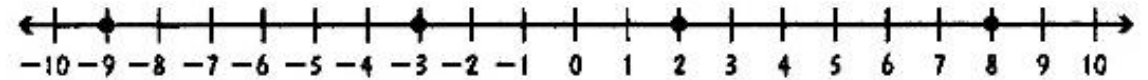
2. D. A temperature of 136°F is a positive number because it is greater than zero and would be represented as 136. A temperature of 126° below zero would be represented as a negative number.
3. C. 10 is greater than zero and would appear to the right of zero on the number line. -10 is less than zero and would appear to the left of zero on the number line.
4. C. Because the temperature in Prospect Creek Alaska is 80°F below zero, a number less than zero, it would be represented as a negative number.

5. B. Opposite numbers have the same digits but different signs.

6. C. The opposite of the opposite of a number is the number itself, so the opposite of the opposite of 25 is 25.

7. B. Because the submarine is 1,500 below sea level, it would be represented by the negative number $-1,500$.

8. B. The opposite of each number is a number with the same digits but a different sign, as represented below.



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9. D. An elevation of 1,237 is above sea level and would be represented by a positive number. A dive of 15 meters below sea level would be represented by a negative number.
10. D. Opposite numbers have the same digits but different signs, so the opposite of 37 is -37 .
11. D. The opposite of the opposite of a number is the number itself, so for the opposite of the opposite of n to be a positive number, n must be a positive number, in this case 21.
12. C. The opposite of 52 is -52 which would be represented by a depth below sea level.
13. B. If the checking account is overdrawn, it has a negative balance. To bring the account to zero you would have to add the opposite, or 42, to the account.
14. D. A depth below sea level is represented as a negative number ($-1,300$), and altitude is represented as a positive number (35,000).

Math-D - Lesson-2

page-1 Compare and order Whole Numbers

1. A. Since $3 > 2$, Zander has enough butter to make the recipe.
2. C. For each set of heights, subtract Height A from Height B to determine the growth of each sunflower: $40 - 3 = 37$, $39 - 3 = 36$, $42 - 4 = 38$, $40 - 5 = 35$. Next, compare and order the numbers from least to greatest: 35 (4), 36 (2), 37 (1), 38 (3).
3. A. Since 17 is greater than 16, Maya goes faster than Victoria.
4. D. Order the amount saved by each person from greatest to least: 177 (Sally), 174 (Ron), 173 (Autumn), 172 (Jasmine). So, Sally has saved the most money and Jasmine has saved the least money.
5. D. Because -8°F represents the temperature on Sunday, and -12 represents the temperature on Saturday, and -12 is less than -8 , the inequality represents that the temperatures on Sunday is greater than the temperature on Saturday, which means that it was warmer on Sunday than it was on Saturday.
6. A. On the number line negative numbers are to the left of zero. -15 is less than -2 because it lies to the left of -2 on the number line. 2 is greater than -2 because it lies to the right of -2 .
7. D. On the number line positive numbers lie to the right of zero. 28 is greater than 16 because it lies to the right of 16 on the number line. -18 is less than 16 because -18 lies to the left of 16 on the number line.
8. D. Since -21 is to the right of -39 on the number line, $-21 > -39$.

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9. D. 7 is less than 9 because it lies to the left of 9. Dustin threw farther than Megan.
10. A. When arranged on the number line, the order of the scores from left (least) to right (greatest) is -5 (Keith), -3 (Russell), -2 (Brianna), and 4 (Jessica). The lesser the score, the better the score is.
11. C. When arranged on a number line, the order of the altitudes from left (least) to right (greatest) is 10,000 (light aircraft), 35,000 (commercial jets), and 41,000 (private jets). The lesser the number the lower the altitude.
12. D. When arranged on a number line, 18 appears to the right of 16 (longer) and to the left of 20 (shorter), so it is greater than 16 but less than 20.
13. B. When arranged on a number line, the largest negative number appears farthest to the left and has the least value. The largest positive number appears farthest to the right and has the greatest value.
14. D. When arranged on a number line, the largest positive number appears farthest to the right and has the greatest value. The largest negative number appears farthest to the left and has the least value.
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Math-D - Lesson-3

page-1 Compare Fractions and Decimals

- 1. D.** Use long division to convert $\frac{16}{9}$ into a decimal number. Because 7 repeats itself in all decimal places, the answer is a repeating decimal.
- 2. C.** The point is located halfway between -4 and -3 on the number line, so the point lies at -3.5 .
- 3. C.** When converted to a decimal (0.875) and plotted on a number line, the point $-\frac{7}{8}$ appears to the right of -1 and to the left of 0 .
- 4. A.** Use long division to convert the fractions to decimals. $-\frac{1}{4} = -0.25$ and $\frac{5}{6} = 0.8\bar{3}$. When arranged on a number line, the largest positive number appears farthest to the right (greatest). The largest negative number appears farthest to the left (least).
- 5. B.** Use long division to divide 7 by 9. When you do so, the quotient is a repeating decimal.
- 6. C.** Use long division to convert each fraction into its decimal equivalent. $\frac{11}{27} = 0.\overline{407}$
- 7. C.** Dividing each bill by the number of people at the table results in a per person cost of $\$4.20$ for the table of 5 people and $\$4.1\bar{6}$ for the table of 6 people. Because $\$4.1\bar{6}$ is a repeating decimal, it rounds up to $\$4.17$.
- 8. B.** Use long division to determine the decimal equivalent of each fraction. The decimal equivalent of $\frac{13}{3}$ is $4.\bar{3}$, which is greater than the decimal equivalent of $\frac{33}{8}$, 4.125 .

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9. B. The point 43.75 lies between 43 and 44 on the number line. Therefore, 43.75 is Point B on the number line.
10. B, D. B is to the right of A, so B is greater than A.
D is to the right of C, so D is greater than C.
11. A. Use long division to convert the fractions to decimals. $-2\frac{3}{8} = -2.375$. When arranged on a number line, the largest negative number appears farthest to the left (least) and the largest positive number appears farthest to the right (greatest).
12. C. Use long division to convert $\frac{7}{8}$ into a decimal number. $\frac{7}{8} = 0.875$, so $5\frac{7}{8} = 5.875$.
13. D. Since $-18 < -17.8$ and $-17.8 < -17$, -17.8 will be between -17 and -18 on a number line.
14. A. $\frac{4}{5}$ is 0.8. 0.75 is less than 0.8.
15. B. $\frac{2}{3}$ is $0.\overline{66}$. 0.66 is greater than 0.4.
16. D. $\frac{5}{8}$ is 0.625. The board must be longer than 5.625 inches. $\frac{13}{16}$ is 0.8125, so the board is 5.8125, which could be trimmed down.

Math-D - Lesson-4

page-1 Absolute Value

1. A. An elevation below sea level is represented by a negative number. To reach sea level from a negative elevation, you must hike up.
2. B. Find the absolute value for each set of numbers.
Since $\frac{3}{8} = 0.375$, $|\frac{3}{8}| = |0.375|$
3. D. Find the absolute value of the amount that Richard would have overdrawn his account.
 $|-\$18.40| = \18.40 to bring the account to zero.
4. C. Because debts are represented as negative numbers, to find the value of his debt, find the absolute value of the balance in his account;
 $|-\$47| = \47 .
5. C. For $|p| < |q|$ when $p > q$, q must be a negative number whose absolute value is greater than the absolute value of p .
6. A. Convert the money spent to the absolute value of the transaction. Since $|-\$19.99| > |-\$17.50|$, Jessica spent more money.
7. D. To compare the magnitude of the temperature change, find the absolute value of each change in temperature. $|5| = 5$ and $|-12| = 12$. Therefore, Sunday had the greatest change in temperature because $12 > 5$.
8. C. The absolute values of opposite numbers are equivalent because the numbers lie the same distance from 0 on the number line.

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9. C. Distance would be represented by the absolute value. $|-79| = 79$. Though the words *down* and *dive* indicate a decrease in elevation, you do not need the negative sign when describing the magnitude of the dive.
10. C. Convert $-\frac{3}{2}$ to its decimal form of -1.5 . -1.5 and 1.5 are opposite numbers, so they have the same absolute value.
11. D. The word *change* implies a movement in score either up or down. Therefore, to compare the changes take the absolute value of the change for each round. 185 is greater than 175 .
12. D. 5 appears to the right of -3 on a number line, so 5 is greater than -3 . The absolute value of 5 is also greater than the absolute value of -3 , because the absolute value of 5 is 5 and the absolute value of -3 is 3 .
13. C. The distance between -4 and 5 is 9 .

Math-D - Lesson-5

page-1 Ordered Pairs of Relationships (X, Y)

1. C. Quadrant III is to the left of the y -axis ($-x$) and below the x -axis ($-y$).
2. B. Quadrant III and Quadrant IV have opposite y -values, so a reflection across the y -axis would move a point from Quadrant III to Quadrant IV.
3. D. A reflection across an axis changes the sign of the corresponding coordinate value. Since F is a reflection of D across both the x - and y -axes, the coordinates of Point F have the opposite x - and y -value as Point D .
4. C. Point A is located in Quadrant II, so it has a negative x -value and a positive y -value.
5. A. Point B is located in Quadrant I, so its x - and y -values are both positive.
6. D. Point C is located in Quadrant IV, so it has a positive x -value and a negative y -value.
7. D. Count the number of units from the origin, the point at which the vertical and horizontal lines intersect. City Hall is located 4 units to the left (-4) and 3 units above (3) the origin.
8. B. Count the number of units from the origin, the point at which the vertical and horizontal lines intersect. The Library is located 6 units to the right (6) and 2 units below (-2) the origin.
9. B. A point reflected across the y -axis results in another point having the same y -value but opposite x -value.

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9. B. A point reflected across the y -axis results in another point having the same y -value but opposite x -value.
10. C. Quadrant II contains points having $(-x, y)$ values. Quadrant IV contains points having $(x, -y)$ values. Since the points in Quadrant IV have opposite y - and x -values from points in Quadrant II, it would take a reflection across both axes to move the point.
11. C. Points in Quadrant III have negative x - and negative y -values.
12. C. Count the number of units from the origin, the point at which the vertical and horizontal lines intersect. The point is located 4 units to the left (-4) and 6 units above (6) the origin.

Math-D - Lesson-6

page-1 Absolute Value on the Coordinate Plane (Distance)

- 1. D.** Find the length of each line segment. The distance between $(4, 4)$ and $(4, -5)$ is 9. The distance between $(4, -5)$ and $(-4, -5)$ is 8. The distance between $(-4, -5)$ and $(-4, -1)$ is 4. The distance between $(-4, -1)$ and $(-1, -1)$ is 3. The distance between $(-1, -1)$ and $(-1, 4)$ is 5. The distance between $(-1, 4)$ and $(4, 4)$ is 5. Add the lengths of all of the line segments ($9 + 8 + 4 + 3 + 5 + 5 = 34$) to find the total yards of fencing needed.
- 2. D.** For each set of coordinate points, find the absolute value of the difference between the coordinate values that differ: $|7 - (-1)| = |8| = 8$.
- 3. D.** The coordinates for the Store and the Office share the same x -value, so find the absolute value of the difference between their y -values: $|3 - (-4)| = |7| = 7$.
- 4. B.** The coordinates for Julio's house and the Library share the same x -value, so find the absolute value of the difference between their y -values: $|2 - (-1)| = |3| = 3$.
- 5. B.** The coordinates for the College and the Library share the same y -value, so find the absolute value of the difference between their x -values: $|1 - 3| = |-2| = 2$.
- 6. C.** A movement to the right is an increase in the value of x , a movement down is a decrease in the value of y . $x = -5 + 6 = 1$; $y = 3 - 5 = -2$.
- 7. B.** A movement to the right is an increase in the value of x , a movement down is a decrease in the value of y . $x = -5 + 5 = 0$; $y = 3 - 6 = -3$.
- 8. A.** The two points share the same y -value, so find the absolute value of the difference between their x -values: $|-5 - 3| = |-8| = 8$.

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- 9. C.** Find the absolute value of the difference between the coordinate values that are different. $|-3 - 6| = |-9| = 9$.
- 10. C.** Find the absolute value of the difference between the coordinate values that are different. $|0 - (-7)| = |7| = 7$.
- 11. C.** The two points have the same y -value, so find the absolute value of the difference between their x -values. $|10 - (-3)| = 13$.
- 12. B.** Find the absolute value of the difference between the coordinate values that are different. $|4 - (-8)| = 12$.

Math-D - Lesson-7

page-1 ADD Rational Numbers (Signed Numbers)

1. A. An increase in height is represented by a positive number while a decrease in height is represented by a negative number. $97\frac{1}{2} + (-97\frac{1}{2}) = 0$.
2. C. Find the sum of each expression to identify the expression whose sum is 9. $17.8 + (-8.8) = 9$.
3. C. In this item, Keith's balance is represented by a positive number. Keith's payment is represented by a negative number because it decreases the amount he owes. $\$173.95 + (-\$50.00) = \$123.95$.
4. B. Making lemonade is represented by a positive number, while selling lemonade is represented by a negative number. $3 + (-3) = 0$.
5. A. Walking to her friend's house is an increase in distance, represented by a positive number. Walking back to the store is a decrease in distance, represented by a negative number. $225 + (-225) = 0$.
6. C. Walking away from home is an increase in distance from home, represented by a positive number. Walking back towards home is a decrease in distance, represented by a negative number.
7. B. A decrease in Sara's ERA is represented by a negative number. $3.21 - 0.65 = 2.56$.
8. A. Adding a negative 3 results in moving 3 units in a negative direction.

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9. C. The first addend is represented by the starting point of the ray above the number line. The length of the ray represents the number being added.
10. B. A deposit represents an increase in the account balance, while a bill payment represents a decrease in the account balance. $25 + (-25) = 0$.
11. C. Because protons and electrons have opposite charges, in order for an isotope to have a total charge of 0, it must have the same number of protons as electrons.
12. D. Adding a positive number results in moving in a positive direction.
13. A. Find the sum of each expression to identify the expression whose sum is -12 . $-8 + (-4) = -12$
14. D. Marcus walked in the opposite direction of the mile markers. To get from marker 5 to marker 1, he walked 4 miles in the opposite direction.
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Math-D - Lesson-8

page-1 (Subtract Rational Numbers (Addition of the Opposite))

1. C. To find the difference in the freezing points, subtract the freezing point of hydrogen from the freezing point of chlorine. Change the subtraction problem into an addition problem and use the rule for adding rational numbers of different signs: $-101.5 - (-259.1) = -101.5 + 259.1 = 157.6$.
2. B. To find the difference in the stock prices, subtract the new price from the old price. Change the subtraction problem into an addition problem and use the rule for adding rational numbers of different signs:

$$33\frac{13}{16} - 34\frac{5}{16} = 33\frac{13}{16} + \left(-34\frac{5}{16}\right) = -\frac{1}{2}.$$
3. C. Change the subtraction problem into an addition problem and use the rule for adding rational numbers of different signs: $-145 - (-234) = -145 + 234 = 89$.
4. B. Subtract the tablet cost from the balance in his account. Change the subtraction problem into an addition problem and use the rule for adding rational numbers of different signs: $159.78 - 239.99 = 159.78 + (-239.99) = -80.21$.
5. B. Change the subtraction problem into an addition problem and use the rule for adding rational numbers of different signs: $4.36 - 5.8 = 4.36 + (-5.8) = -1.44$.
6. A. Convert $-\frac{4}{5}$ into a fraction with a like denominator of 10: $-\frac{4}{5} \times \frac{2}{2} = -\frac{8}{10}$. Change the subtraction problem into an addition problem. Because the signs are the same, add the numbers: $-\frac{8}{10} - \frac{7}{10} = -\frac{8}{10} + \left(-\frac{7}{10}\right) = -\frac{15}{10}$, or $-1\frac{1}{2}$.
7. D. The distance of the two houses is in relation to the park. In this case, the park represents 0 on the number line. East represents a positive number. West represents a negative number.

$$\left|4\frac{1}{3} - \left(-2\frac{5}{6}\right)\right| = \left|4\frac{1}{2} + 2\frac{5}{6}\right| = 7\frac{1}{6}$$

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8. C. To find the difference in miles run, subtract the number of miles Jackson ran from the number of miles Kellen ran. $4.2 - 3.8 = 0.4$.
9. D. Subtracting a negative is the same as adding a positive. $7.8 - (-2.43) = 7.8 + 2.43 = 10.23$.
10. D. To find the distance between the elevation, take the absolute value of the difference between the elevations. An elevation below sea level is represented by a negative number. $|563 - (-349)| = |563 + 349| = 912$.
11. A. Subtract the temperature at Mary's house from the temperature at her sister's house to find the change in temperature. $76 - (-12) = 76 + 12 = 88$.
12. C. Convert each mixed number into an improper fraction having like denominators: $5\frac{1}{8} = \frac{41}{8} = \frac{205}{40}$; $3\frac{9}{10} = \frac{39}{10} = \frac{156}{40}$. Use the rules for adding rational numbers with opposite signs: $\frac{205}{40} - \frac{156}{40} = \frac{205}{40} + \left(-\frac{156}{40}\right) = \frac{49}{40}$, or $1\frac{9}{40}$.
13. D. To find the distance, take the absolute value of the difference between the elevations. An elevation below sea level is represented by a negative number.

Math-D - Lesson-9

page-1 Multiply and Divide Rational Numbers (Like and Unlike Signs)

1. A. To find the change in balance of her bank account, multiply the change per month of -15.87 by the number of months, 5. Since the numbers have different signs, the answer is a negative number.
2. B. To find the change in elevation, multiply the rate of descent, $-26\frac{2}{3}$, by the number of minutes, 4. Since the numbers have different signs, the answer is a negative number.
3. D. The product of two factors with different signs is a negative number.
4. B. To find how much debt is paid each month, divide the total debt, -720 , by the number of months, 12. Since the numbers have different signs, the answer is a negative number.
5. C. The product of two positive numbers is a positive number.
6. C. The product of two positive numbers is a positive number.
7. D. To find the change in temperature, multiply the change in temperature, -4 , by the number of hours, 7. Since the numbers have different signs, the answer is a negative number.
8. D. When both numbers in a division problem are negative, the quotient is a positive number.

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9. B. The quotient of two numbers with different signs is a negative number. $-11 \div 16 = -0.6875$. Rounded to the nearest hundredth (penny), the answer is $-\$0.69$.
10. D. The product of two numbers with different signs is a negative number.
11. D. To find the number of miles Jacob has completed, multiply 0.75 by 26.2. The product of two numbers with the same sign is a positive number.
12. A. The quotient of two numbers with different signs is a negative number.
13. B. The quotient of two numbers with the same sign is a positive number.
14. C. Divide the total change in elevation, -392 , by the rate of descent, -56 . The quotient of two numbers with the same sign is a positive number.
15. A. Multiply the unit rate, -24 , by the time, 12, to find the total change in volume. The product of two numbers with different signs is a negative number.
16. B. The quotient of two numbers with different signs is a negative number.
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Math-D - Lesson-10

page-1 Estimate and Compare IRRATIONAL Numbers

1. C. Since 20 is between 16 (4^2) and 25 (5^2), $\sqrt{20}$ is between 4 and 5.
2. A. Since 56 is between 49 (7^2) and 64 (8^2), $\sqrt{56}$ is between 7 and 8 .
3. C. Since 95 is between 81 (9^2) and 100 (10^2), $\sqrt{95}$ is between 9 and 10.
4. D. Since 39 is between 36 (6^2) and 49 (7^2), $\sqrt{39}$ is between 6 and 7.
5. A. Because π is a little greater than 3, π^2 is a little greater than 3^2 , or 9.
6. D. Because $11^2 = 121$, 11 is less than $\sqrt{125}$.
7. B. Because $9^2 = 81$, $\sqrt{87} > 9$, or 3^2 .
8. C. The square roots of numbers listed in decreasing order are themselves in decreasing order.

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9. D. $\sqrt{79}$ is between 8 and 9. $8^2 = 64$. $9^2 = 81$. Since you know $\sqrt{79}$ is closer to 9, you narrow down the possible answers to 8.5 and 9. $8.5^2 = 72.25$, so $\sqrt{79}$ is closer to 9.
10. B. Find the approximate value of each expression by substituting 3 for π . $\frac{\pi}{3} = 1$, $(5.2 - \pi) = 2.2$, $(\pi + 3) = 6$, $3\pi = 9$.
11. B. To find an approximate value of -5π , substitute 3 for π . $-5\pi = -5(3) = -15$.
12. C. To find an approximate value of $\sqrt{11} + 5\pi$, approximate the value of $\sqrt{11}$. $3^2 = 9$. $4^2 = 16$, so $\sqrt{11}$ is closer to 3. Substitute 3 for $\sqrt{11}$ and for π . $\sqrt{11} + 5\pi = 3 + 5(3) = 18$.
13. B. $\sqrt{19}$ is between 4 and 5, but closer to 4.
14. A. $\sqrt{60}$ is between 7 and 8, but closer to 8.
15. D. $\sqrt{5}$ is between 2 and 3, but much closer to 2.
16. C. $\sqrt{24}$ is between 4 and 5, but much closer to 5.

Math-D - Lesson-UNIT-1

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1. C. A deposit of \$45.75 will increase Jimmy's balance and is represented as a positive number. A \$15 withdrawal will decrease Jimmy's account and is represented as a negative number. 6.NS.5

2. B, C, D. Zero marks the boundary between positive and negative numbers. 6.NS.6.a

3. Part A: C. Order the numbers from greatest to least; Violet (\$101), Carl (\$82), Valerie (\$75), Ethan (\$65). Violet has the most money.

Part B: B. Ethan has the least money. 6.NS.7.b

4. Part A: A. $-8 < -2 < 10 < 15$. -8 is the coldest. 15 is the warmest. From coldest to warmest: Wednesday, Sunday, Tuesday, Monday.

Part B: B. From warmest to coldest: Monday, Tuesday, Sunday, Wednesday. 6.NS.7.b

5. D. Because -5.25 is greater than -6 but less than -5 , it appears on the number line between -5 and -6 . 6.NS.6.c

6. C. Because $\frac{5}{7}$ is greater than 0 but less than 1, it appears on the number line between 0 and 1. 6.NS.6.c

7. D. Use long division. Remember to place the decimal point to the right of 3 and directly above it in the quotient when dividing. 7.NS.2.d

8. C. Opposite numbers have the same absolute value. 6.NS.7.c

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9. D. Only opposite numbers can have the same absolute value but be greater than or less than the other number. 6.NS.7.d
10. B. You plot a point in Quadrant III by first moving left, or in the negative direction, along the x -axis and then moving down, or in the negative direction, parallel to the y -axis. 6.NS.6.b
11. D. Reflecting across the x -axis changes the sign of the y -coordinate. 6.NS.6.b
12. C. Because the y values in the two points are the same, the points lie on a vertical line. Take the absolute value of the difference between the x values of the points to find the distance. $|-2 - (-7)| = |-2 + 7| = |5| = 5$. 6.NS.8
13. A. An increase in altitude is represented by a positive number and a decrease in altitude is represented by a negative number; $30,000 + (-30,000) = 0$. 7.NS.1.a
14. C. An increase in temperature is represented by a positive number; $-2 + 2 = 0$. 7.NS.1.a
15. A. Adding a negative number to a number results in a movement in the negative direction. 7.NS.1.b
16. C. Walking away from home is represented by a positive number while walking back towards home is represented by a negative number. 7.NS.1.b
17. C, E. Subtracting a number is the same as adding its opposite. 7.NS.1.c
18. B, E. To calculate distance on a number line, take the absolute value of the difference between the two endpoints. 7.NS.1.c
19. C. Convert the second fraction into a fraction with a like denominator; $-\frac{3}{4} = -\frac{6}{8}$. Then, add the opposite of the second fraction to the first; $-\frac{11}{8} + \frac{6}{8} = -\frac{5}{8}$. 7.NS.1.c
20. C. Multiplying the value lost each day times the number of days results in the total value lost over the total number of days, or \$8.25 lost in 3 days. 7.NS.2.a
21. D. Since they use 3 bags of cat food every day, divide $\frac{3}{4}$ by 3. 7.NS.2.b
22. D. Determine the nearest perfect square less than 71 and the nearest perfect square greater than 71; 64 and 81. Then, take the square roots of the perfect squares; $\sqrt{64} = 8$, $\sqrt{81} = 9$. 8.NS.2