

## MATH ANSWER KEY

### Exercise 1

- A.
- 16
  - 9
  - 111
  - 153
  - 358
  - 8,257
  - 13,756
  - 153,621
  - \$2.43

- B.
- 4
  - 29
  - 318
  - 142
  - 1.439
  - 2.905
  - 21,848
  - \$5.31
  - \$359.69

- C.
- 39
  - 376
  - 2,780
  - 2,184,498
  - \$6,086.16

- D.
- 8
  - 61
  - 962
  - 125
  - \$5.32

### Exercise 2

- A.
- $1\frac{3}{4}$
  - $\frac{9}{9}$
  - $\frac{5}{6}$
  - $\frac{15}{10}$
  - $\frac{12}{4}$
  - $\frac{20}{16}$
  - $\frac{20}{20}$

- B.
- 5
  - $1\frac{1}{2}$
  - 3
  - $1\frac{1}{4}$

- 1
- $1\frac{1}{2}$
- $3\frac{1}{5}$
- $\frac{4}{9}$
- $3\frac{8}{9}$
- $2\frac{1}{3}$

Divide the denominators into the numerators.

- C.
- $\frac{1}{2}$
  - $\frac{33}{40}$
  - $1\frac{2}{9}$
  - $\frac{5}{8}$
  - $1\frac{1}{3}$
  - 1
  - $\frac{9}{14}$
  - $1\frac{7}{10}$
  - $\frac{7}{18}$
  - $1\frac{5}{8}$
  - $1\frac{1}{2}$
  - $\frac{21}{22}$

### Exercise 3

- $\frac{1}{4}$
- $\frac{1}{8}$  yd.
- $1\frac{2}{9}$  acres
- $\frac{27}{64}$  pound
- $3\frac{1}{4}$  acres
- $\frac{7}{12}$  acre

### Exercise 4

- $\frac{3}{16}$  mile
- 24
- $\frac{2}{5}$
- $\frac{1}{4}$  pound
- 96
- $3\frac{5}{9}$
- 56 blocks

### Exercise 5

- B – Add the hours and divide by 3 for the average.
- C – Multiply mileage one way (16.4) by 2. Multiply the result by 6. Point off one decimal place in the product, since the multiplicand had one decimal place.

3. A – Divide the total miles by miles per gallon and multiply by the cost per gallon of the gasoline. Point off the correct number of decimal places following the rules for division and multiplicand.
4. D – Multiply 35 by the decimal equivalent of  $\frac{3}{4}$  (0.75). Point off two decimal places in the product.
5. A – Divide the price per pound into the amount of money available. Move the decimal points two places to the right.
6. C – Divide the total number of quarts by 3. The decimal point is not moved, since the divisor is a whole number.
7. B - \$5.40. Divide \$46.20 by 3.

#### Exercise 6

1. D – Divide the yearly income by 12 to find monthly income. Multiply the result by 0.25. Or multiply the yearly income by 0.25 and divide the answer by 12.
2. B – Multiply the previous month's salary by 0.06. Add the result to the previous month's salary to get the amount after the raise.
3. C – Find the difference between the cost and the selling price. This represents the amount of increase. Divide this figure by the original cost to get the percentage of profit (percent of increase).
4. C – Convert  $\frac{3}{8}\%$  to a decimal (0.00375). Multiply \$45 by 0.00375 and subtract the result from \$45.
5. D – Multiply the weekly sales by 0.08.
6. B – Convert 80% to a decimal (0.80) and multiply times 40.
7. A – One in ten is  $\frac{1}{10}$  or 10%.

#### Exercise 7

1. {Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday}
2. {a, b, c, d, e}
3. {1, 3, 5, 7, 9, 11, 13, 15}
4. *Yes*. Numbers are endless.
5. *No*. There is a limit to the number of months.
6. *Subset*. Monday and Tuesday are contained in a larger set.
7.
  - a. *null set*. By definition, teenagers are persons from 13 to 19 years old.
  - b. *equivalent, equal*. Both sets have the same elements and the same number of elements.
  - c. *equivalent, disjoint*. Both sets have the same number of elements, but there are no common elements.
  - d. *overlapping*. Dog is common to both sets.
8.
  - a. {6, 8, 12}. This set contains all the elements common to both sets and is, therefore, the intersection of the two sets.
  - b. {baseball} This set is the intersection of the two sets, as it contains the common element of the two sets.
  - c. {1, 4, 12, 3, 7, 21, 10, 5, 8} This set is the union of the two sets, since it contains all the different elements from both sets.
  - d. {apples, oranges, bananas, pears, raisins, grapes}. This set is the union of the two sets.

#### Exercise 8

1. B
2. C
3. A
4. D
5. A
6. D
7. A
8. C
9. A
10. D

11. C
12. A
13. A
14. D

In 15-26, perform the indicated operations. Isolate the unknown and then solve for the unknown.

15.  $X = 6$
16.  $X = 4$
17.  $X = 2$
18.  $X = 6$
19.  $X = 6$
20.  $X = 1$
21.  $X = 6$
22.  $X = 2$
23.  $X = 9$
24.  $X = 6$
25.  $X = 3$
26.  $X = 2$

### Exercise 9

1. C  $I = prt$   
 $I = \$350 \times 12\% \times 1 = \$42$   
 Amount paid  $\$350 + \$42 = \$392$ .
2. B Add the lengths of the three sides, then convert this figure to feet (by multiplying times 5,280). Multiply the number of feet times the cost per foot.
3. A  $P = 2L + 2W$ . Add the 2 lengths and 2 widths. Multiply by 3.
4. A  $C = \pi D$ . Substitute the diameters of the two circles in the formula  $C = \pi D$ . Evaluate the equations and find the difference. A quick mental solution to the problem is to notice that the difference in the diameters is one inch. Thus the difference in the circumferences will be one times 3.1416, or 3.1416.
5. B  $C = \pi D$  or  $C = 2\pi r$ . Since the radius is given, substitute its value in the formula and solve the equation.

6. D  $C = \pi D$ . To find a missing part, substitute the known values and reorganize the formula.
7. C  $I = prt$   
 $I = \$1,500 \times 14\% \times 2q$   
 $I = \$210 \times 2$   
 $I = \$420.00$

### Exercise 10

1. C Use the formula for finding the area of a rectangle to find the area of the front lawn and the number of square feet in one yard. Find the number of square yards in the lawn. Divide this figure by 5 and multiply the quotient by 1.8.
2. A Apply the formula  $A = \frac{1}{2}bh$ . Point off the correct number of decimal places when multiplying.
3. D Divide the diameter by 2 to find the radius, and then apply the formula  $A = \pi r^2$ .
4. A Apply the formula  $v = lwh$  to find the number of cubic feet in the driveway. Find the number of cubic feet in a cubic yard. Divide this figure into the volume of the driveway. Multiply the result by \$20.50.
5. B Apply the formula  $V = \pi r^2h$  and divide the result by the number of cubic feet in a cubic yard.
6. D Convert 50 yards to feet. Apply the formula  $l = A/w$
7. C  $30 \times 40 = 1,200$  sq ft.  
 $1,200 \div 200 = 6$  gallons
8. D A third measurement, length, is required to determine volume.

### Exercise 11

1. C Apply the formula for finding the area of a triangle which is  $A = \frac{1}{2}bh$
2. A Add the lengths of the three sides to find the perimeter of an equilateral triangle.
3. C The area of a rectangle is determined by multiplying the length by the width.

4. *D* triangles, rectangles, and parallelograms are polygons because they are closed figures formed by straight line segments all in the same plane. The line segments intersect only at their end points, and only two line segments intersect at any one point
5. *B* Octa means eight.
6. *D* The definition gives the features of a parallelogram
7. *D*
8. *B* Apply the formula for area of a square which is  $A = S^2$ .

### Exercise 12

- A.
  1. *36,000,000 boxes*. Each symbol represents 2,000,000 and there are 18 symbols. Multiply 2,000,000 by 18 to find the amount of boxes.
  2. *Three times greater*. Texas produces  $\frac{3}{4}$  of a million boxes and California produces  $2\frac{1}{4}$  by  $\frac{3}{4}$
  3. *43,000,000 boxes* Add the symbols and multiply the  $21\frac{1}{2}$  symbols by 2,000,000.
- B.
  1. *January*. Both graphs show  $25^\circ$  for January.
  2.  $35^\circ$  The bar is at the level on the graph.
  3.  $35^\circ$  The dot is at this point on the graph.
- C.
  1. *22.6%* Subtract the 77.4% from 100%.
  2. *3.4%* Add 1.3%, 1.6%, and 0.5%.
  3. *96.6%* Add 77.4% and 19.2%.
  4. *Protein (1.3%) and fat (1.6)*

## Test Answer Key

### Test 1

1. C
2. C
3. B
4. A
5. A
6. B
7. B

### Test 2

1. D
2. C
3. B
4. C
5. A
6. B

### Test 3

1. A
2. C
3. D
4. C
5. A
6. C
7. A

### Test 4

1. A
2. C
3. B
4. C
5. A
6. C