GED® - Quiz Questions with Answers

Mathematical Reasoning

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1.

After working 8 hours, Marsha graded 48 papers. If she continued to work at the same rate, how many papers could she grade in 12 hours?

72

36

60

48

Correct answer: 72

Let x = number of papers Marsha can grade in 12 hours, and then set up a proportion.

8 / 48 = 12 / x

8x = 12(48)

8x = 576

x = 72

2.

Solve the following by subtracting.

5/9 - 1/7

26/63

4/9

2

4/63

Correct answer: 26/63

1. Find the Least Common Denominator (LCD) of 5/9, 1/7

Method 1: By Listing Multiples List out all multiples of each denominator, and find the first common one.

9 : 9,18,27,36,45,54,63

7 : 7,14,21,28,35,42,49,56,63

Therefore, the LCD is 63

Method 2: By Prime Factors List all prime factors of each denominator, and find the union of these primes.

9 : 3,3

7 : 7

Therefore, the LCD is 3×3×7=63

2. Make the denominators the same as the LCD

(5×7)/(9×7) − (1×9)/(7×9)

3. Simplify - Denominators are now the same

35/63 − 9/63

4. Join the denominators

(35−9)/63

5. Simplify

26/63

3.

Solve:

3.67 + 2.002 = x

5.672

56.72

2.369

5.369

Correct answer: 5.672

To add two numbers with a different number of decimal places, begin by lining up the decimal points. One easy way to do this is to add zeros to the end of the shorter number after the decimal point (3.67 turns into 3.670). Then, add from right to left.

3.670 + 2.002 = 5.672

4.

A farmer started breeding his cowherd with 9 Friesian cows. At the end of 3 years, he had 16 cows. What is the percentage increase of the cows?

78%

89%

75%

56%

Correct answer: 78%

To find the increase in the number of cows, subtract the final number of cows from the initial number of cows.

16 - 9 = 7

To find the percentage increase, solve the following:

$$\frac{\text{percentage increase}}{\text{initial number}} = \frac{7}{9}$$

$$\frac{7}{9} = 0.78$$

Multiply 0.78 by 100 to find the percentage:

0.78 × 100% = 78%

5.

If twice a number is half of the sum of that number and 12, what is the value of the number?

4

2

12

6

Correct answer: 4

'Twice a number' is 2 times a number x, or 2x.

'Half the sum of that number and 12' is x + 12 multiplied by 1/2, or:

$$\frac{x + 12}{2}$$

Therefore, 2x = (x +12)/2

Solve for x.

2x = (x +12)/2

2(2x) = x +12

4x = x +12

3x = 12

x = 4

6.

A room is 20 feet long, 8 feet wide, and 12 feet high. How many square yards of wallpaper are needed to paper the four walls of the room?

74.7

62.8

42.6

36.2

Correct answer: 74.7

Area of front wall = 20 x 12 = 240 sq. ft.
We multiply this by 2 since the front and back walls are the same.
240 x 2 = 480 sq. ft.

Area of side wall = 8 x 12 = 96 sq. ft.
We multiply this by 2 since the front and back walls are the same.
96 x 2 = 192 sq. ft.

Total area of walls =
480 + 192 = 672 sq. ft.
672 / 9 = 74.7 sq. yd.

7.

Blueprints for a house are drawn on a 1:10 scale. If one of the bedrooms of the actual house measures 10 feet by 12 feet, what are the measurements on the blueprints?

12” x 14.4”

10” x 12”

5” x 6”

1” x 1.2”

Correct answer: 12” x 14.4”

First, convert 10 feet into inches.

1 foot = 12 inches

1 foot x 12 = 12 inches x 10 = 120 inches

Next, convert 12 feet into inches.

1 foot = 12 inches

1 foot x 12 = 12 inches x 12 = 144 inches

Next, set up proportions to find the dimensions on the blueprints.

1/10 = x/120

10x = 120

x = 12 inches

1/10 = x/144

10x = 144

x = 14.4 inches

The 10’ x 12’ bedroom will measure 12” x 14.4” on the blueprints.

8.

The Smith family spends 30% of its monthly income on food, 20% on rent, and 40% on other expenses. The Smiths save the remainder. If the family saves $400 per month, what is its monthly income?

$4,000

$4,400

$3,600

$3,200

Correct answer: $4,000

Expenditures: 30% + 20% + 40% = 90%

Savings: 100% - 90% = 10%

Let x = Smith family's monthly income. Then, .10x=$400, so x = $400/.10 = $4,000.

9.

Darcie writes an article for the paper every 2 hours. How many articles does Darcie write in 48 hours of work?

24

96

48

52

Correct answer: 24

24 articles is the correct answer. In order to find out how many articles Darcie writes in 48 hours, you need to divide: 48 / 2 = 24.

10.

The class of 32 children had 14 boys and the remainder were girls. What was the ratio of boys to girls?

7/9

1/14

7/16

9/16

Correct answer: 7/9

The class had 32 children in all, including 14 boys. Subtract to find the number of girls.

32 - 14 = 18

Therefore, the ratio of boys to girls is 14/18. To reduce this, divide the numerator and denominator by 2.

(14 ÷ 2)/(18 ÷ 2) = 7/9

11.

Express 92,345 in scientific notation.

9.2345×10^4

92.345×10^3

0.92345×10^5

923.45×10^2

Correct answer: 9.2345×10^4

To express a number in scientific notation, express it as the product of a number between 1 and 10 and a power of 10. In this case, the number between 1 and 10 is 9.2345. In going from 9.2345 to 92,345, you move the decimal point 4 places to the right. Each move represents a multiplication by 10, and 4 moves represents a multiplication by 10^4. Therefore, the correct answer is 9.2345×10^4.

12.

Find the value of x by solving the following proportion.

18:x :: 3:60

360

30

180

75

Correct answer: 360

1. Rewrite the proportion as a fraction

18/x = 3/60

2. Simplify 3/60 to 1/20

18/x = 1/20

3. Multiply both sides by x

18 = 1/20 x

4. Simplify 1/20 x to x/20

18 = x/20

5. Multiply both sides by 20

360 = x

6. Switch sides

x = 360

13.

The local motorcycle dealership was hosting a ride on Saturday. There were 310 motorcycle riders on Saturday's ride. If there were four times as many male riders as female, how many female riders were on Saturday's ride?

62 female riders

258 female riders

46 female riders

80 female riders

Correct answer: 62 female riders

Set up an equation to find the number of female riders, represented by x.

Because there are four times as many male riders, this can be expressed as 4x.

The total number of riders is 310, so 4x + x = 310. Solve for x.

4x + x = 310

5x = 310

x = 62

14.

A trader made a profit of 15% when he sold a 30-gallon plastic tank for $400. What was the original cost of the tank?

$348

$460

$340

$471

Correct answer: $348

The trader made a 15% profit and sold the tank for $400.

First, convert 15% to a decimal.

15% = 15/100 = 0.15

Set up an equation to find the original cost of the tank, x.

$400 = x + 0.15x

$400 = 1.15x

x = $400/1.15

x = $347.83 ≈ $348

15.

When 7 is added to a number y, the result is 2 more than twice the number. What is the value of y?

y = 5

y = -9

y = -5

y = 9

Correct answer: y = 5

7 added to y can be expressed as 7 + y

2 more than twice the number is 2y + 2

Therefore, the equation is 7 + y = 2y + 2

y - 2y = 2 - 7

-y = -5

y = 5

16.

Carrie sold 112 boxes of cookies, Megan sold 126 boxes of cookies, Julie sold 202 boxes of cookies, and Ashton sold 176 boxes of cookies. What was the average number of boxes of cookies sold by each individual?

154

125

136

162

Correct answer: 154

In order to find the average, you will first need to sum the number of boxes sold: 112 + 126 + 202 + 176 = 616. Then, to find the average, you will need to divide the sum by the number of individuals who sold cookies: 616 ÷ 4 = 154.

17.

$|5 + x| = 10$

Which of the following options is the correct solution set for the above equation?

{-15, 5}

{5, 15}

{-5, 5}

{-15, -5}

Correct answer: {-15, 5}

The bars which surround the equation signify "absolute value," which refers to the distance away from zero. Therefore, solutions to absolute value equations can be either positive or negative. The equation $|5 + x| = 10$ can be written in two ways:

$5 + x = 10$ and $5 + x = -10$

Solve the first equation.

$5 + x = 10$

$x = 5$

Solve the second equation.

$5 + x = -10$

$x = -15$

Therefore, the correct solution set is {-15, 5}.

18.

If a fish swims 5 miles in 1.5 hours, how far will it swim in 9 hours?

30 miles

45 miles

58 miles

26 miles

Correct answer: 30 miles

This question can be answered by setting it up as a proportion

5 miles/1.5 hours = n miles/9 hours

5/1.5 = n/9

Cross multiply to solve.

(5 × 9) = (1.5 × n)

1.5n = 45

n = 45 ÷ 1.5

n = 30 miles

19.

25% of a number is 36. What is 16% of the number?

23

26

59

32

Correct answer: 23

First, convert 25% to a decimal.

25% = 25/100 = 0.25

Set up an equation based on the given information.

0.25x = 36

x = 36/0.25 = 144

Find 16% of 144.

16% = 16/100 = 0.16

0.16 × 144 = 23.04 ≈ 23

20.

Find the **lowest** number in the following set:

1/3, 5/13, 3/11, 1/5, 2/9

1/5

1/3

5/13

2/9

Correct answer: 1/5

Divide to convert each fraction to a decimal:

1 ÷ 3 = 0.33

5 ÷ 13 = 0.38

3 ÷ 11 = 0.27

1 ÷ 5 = 0.20

2 ÷ 9 = 0.22

The lowest value = 0.20 = 1/5

21.

Solve the inequality:

-3x – 5 < 22

x > -9

x < -9

x > 9

x < 1/9

Correct answer: x > -9

Solve the inequality as follows:

- *-3x -5 < 22*
- *Add 5: -3x < 27*
- *Divide by -3: x > -9*

You will notice that the sign flipped. This occurs in an inequality when a positive number turns negative, or vice versa.

22.

Solve:

(2/5) × (5/8)

1/4

16/25

7/13

25/16

Correct answer: 1/4

To multiply a fraction, multiply the numerators and the denominators.

2/5 × 5/8

(2 × 5) / (5 × 8) = 10/40

Reduce the fraction to simplest terms.

10/40 ÷ 10/10

(10 ÷ 10) / (40 ÷ 10) = 1/4

23.

12-year-old Sandra wants to buy a sound system for her bedroom but doesn't have enough money to purchase the one she wants, which costs $650. Sandra's parents offer to give her a 0% loan that she can pay back over the course of 12 months. Sandra has $80 saved and finds a $50 coupon that she can use toward the cost of the radio.

How much money will Sandra be paying her parents each month, assuming she takes 12 months to pay them back?

$43.33

$66.67

$24.05

$52.87

Correct answer: $43.33

We start with the total price of the sound system, $650, and then subtract the sum of Sandra's savings and the coupon. This amount is divided by 12 to find the amount Sandra will be paying each month as she will not be accruing interest on a 0% loan.

(650 - (80 + 50)) / 12 = (650 – 130)/12 = 520/12 = $43.33

24.

Two babies were born on Tuesday. The first baby weighed 6 1/4 pounds, and the second baby weighed 7 3/8 pounds. What was the total weight of the two babies?

13 5/8 pounds

13 1/8 pounds

42 1/3 pounds

42 5/8 pounds

Correct answer: 13 5/8 pounds

Add the two fractional amounts together by finding a common denominator. Since 8 can be divided evenly by 4, 8 is the common denominator.

6 1/4 = 6 2/8

Next, add the base numbers of the fractions together.

6 + 7 = 13

Add the fractions together.

2/8 + 3/8 = 5/8

Combine the base number and fraction for the answer: 13 5/8 pounds.

25.

Solve:

(3x - 4x + 2y) × (2y + 3y + 2x)

$-2x^2 - xy + 10y^2$

$2y - 5xy + 2xy$

$xy + 10x^2$

$2y^2 - 10x$

Correct answer: $-2x^2 - xy + 10y^2$

(3x - 4x + 2y) × (2y + 3y + 2x)

1) Collect like terms:

= (-x + 2y) × (5y + 2x)

2) Multiply each term:

$-5yx - 2x^2 + 10y^2 + 4xy$

3) Combine like terms and rearrange to standard form:

$-2x^2 - xy + 10y^2$

26.

Over time, the value of a house increases but its mortgage decreases. Which of the factors is independent?

Time

House value

Mortgage

House

Correct answer: Time

Both the value of the house and mortgage depend on the time, while the house is a constant. Therefore, only time can be the independent variable.

27.

Brandon's math average is based on five tests. Brandon's test scores were 75, 83, 94, 85, and 98. What is Brandon's math average for the five tests?

87

77

80

85

Correct answer: 87

To find the average, take the sum of the scores and divide it by the number of tests. 435 ÷ 5 = 87.

28.

How many 6-inch by 4-inch bricks are needed to build a walk 6 feet wide and 24 feet long?

864

432

648

76

Correct answer: 864

The width of the walk is 6 ft., or 6 x 12 = 72 in. The width of each brick is 4 in. The number of bricks that can be fitted along the width is 72 / 4 = 18. The length of the walk is 24 ft., or 24 x 12 = 288 in. The length of each brick is 6 in. The number of bricks that can be fitted along the length is 288 / 6 = 48. 18 x 48 = 864.

29.

An investor invests $12,000 in a mutual fund and earns 4.9% on the principle for each of five years. How much interest has accrued at the end of the period?

$2,940

$3,148

$2,805

$2,674

Correct answer: $2,940

To calculate interest earned over a period of time, you would use the formula I=PRT.

Interest equals principle ($12,000) times the rate of return (.049) times the length of time (5 years): (12,000)(.049)(5) = $2,940.

30.

Elizabeth works 12 hours per week and earns $10.50 per hour. 20% of her paycheck is taken for taxes and other withholdings. How much money does Elizabeth take home in a two-week period?

$201.60

$100.80

$126.00

$252.00

Correct answer: $201.60

First, calculate how much Elizabeth makes per week:

$10.50 per hour × 12 hours = $126 per week

Next, multiply that by 20% to account for withholdings.

$126 × 20%

$126 × 0.20 = $25.20 (weekly withholding)

Subtract withholdings from her weekly earnings.

$126 - $25.20 = $100.80

To find her income for two weeks, multiply by 2.

$100.80 × 2 = $201.60

31.

Brent measured the board at 8 3/4 feet. Shawn measured the same board at 6 1/2 feet. What is the difference between Brent's measurement and Shawn's measurement?

2 1/4 feet

3 feet

2 1/3 feet

1 2/3 feet

Correct answer: 2 1/4 feet

To find the difference, convert all mixed numbers to improper fractions.

8 3/4 = 35/4

6 1/2 = 13/2

Next, find a common denominator and subtract the numbers.

35/4 - (13/2)(2/2)

35/4 - 26/4 = 9/4 = 2 1/4 feet

8 3/4 - 6 2/4 = 2 1/4

You could also use the Bowtie method where you first need to convert the mixed numbers into improper fractions:

8 3/4 = 35/4, and 6 1/2 = 13/2

Then, 35/4 - 13/2 = (70 - 52) / 8 = 18/8 = 9/4 = 2 1/4.

32.

During the months of June and July, a town received 1 2/3 inches and 2 1/5 inches of rainfall respectively. If, in the month of October, the town received twice the difference of the two months, how much was the amount?

1 1/15 inches

8/15 inches

1 7/15 inches

4/15 inches

Correct answer: 1 1/15 inches

To find twice the difference of the two months, multiply the difference by 2.

2(2 1/5 - 1 2/3)

Change to improper fractions.

2(2 1/5 - 1 2/3)

2(11/5 - 5/3)

Next, find common denominators and subtract the fractions.

2(11/5 - 5/3)

2[(11/5)(3/3) - (5/3) (5/5)]

2(33/15 - 25/15)

2(8/15) = 16/15, or 1 1/15

33.

Roselyn lost 4% after selling her used couch for $320. Find the original price of the couch.

$333

$336

$340

$342

Correct answer: $333

The original price of the couch is 100% of the selling price minus 4%.

100% - 4% = 96%, or 0.96.

Set up an equation to solve for the original cost, c.

320 = 0.96c

320 ÷ 0.96 = c

c = 333.33 = ~$333

34.

If Steven gets paid $2,000 each month, what is his yearly income after an annual tax reduction of 23%?

$18,480 after taxes

$15,520 after taxes

$20,480 after taxes

$21,700 after taxes

Correct answer: $18,480 after taxes

Find out how much Steven earns per year by multiplying his monthly salary by 12.

$2,000 × 12 = $24,000

Find 23% of $24,000 by converting 23% to a decimal and multiplying.

23% = 23/100 = 0.23

0.23 × $24,000 = $5,520

Since the question asks for Steven's income after taxes, subtract the taxes from his yearly salary.

$24,000 - $5,520 = $18,480 after taxes

35.

Arrange the following fractions in descending order:

1/3, 2/5, 4/11, 3/7

3/7, 2/5, 4/11, 1/3

4/11, 3/7, 2/5, 1/3

1/3, 2/5, 3/7, 4/11

4/11, 2/5, 3/7, 1/3

Correct answer: 3/7, 2/5, 4/11, 1/3

To arrange the fractions, compare their values by first multiplying them by 100%.

- *1/3 × 100% = 33.33%*
- *2/5 × 100% = 40%*
- *4/11 × 100% = 36.36%*
- *3/7 × 100% = 42.86%*

Arrange the percentages from largest to smallest (descending order).

42.86%, 40%, 36.36%, 33.33%

Convert back to fractions.

3/7, 2/5, 4/11, 1/3

36.

Simplify

5 1/4 ÷ 2 1/2

2 1/10

13 1/8

2 1/8

8 1/8

Correct answer: 2 1/10

In order to simplify the expression, convert the mixed numbers to improper fractions.

5 1/4 = 21/4

2 1/2 = 5/2

5 1/4 ÷ 2 1/2 = 21/4 ÷ 5/2

To divide by a fraction, multiply by its reciprocal.

21/4 ÷ 5/2 = 21/4 × 2/5, or 42/20.

Reduce to its lowest terms.

42/20 ÷ 2/2 = 21/10

Finally, express 21/10 as a mixed number.

21/10 = 2 1/10

37.

(5 1/4) ÷ (2 1/2)

Which of the following options correctly simplifies the above expression?

2 1/10

13 1/8

2 1/8

8 1/8

Correct answer: 2 1/10

In order to simplify the expression, you should begin by expressing the mixed numbers as improper fractions: 5 1/4 = 21/4, and 2 1/2 = 5/2.

*In order to divide by a fraction, you will need to multiply it by its reciprocal. Thus, 21/4 ÷ 5/2 = 21/4 * 2/5, or 42/20.*

Then reduce it to its lowest term: 42/20 ÷ 2/2 = 21/10. Then, express 21/10 as a mixed number: 2 1/10.

38.

A school has 15 classes with 22 students in each class. In order to reduce class sizes to 20 students per class, how many new classes must be formed?

2

4

3

5

Correct answer: 2

There should be 2 new classes formed. The number of students in the school is 15 x 22 = 330. If there are to be no more than 20 students in a class, the number of classes needed is 330 / 20 = 16.5. We will round up to 17, since there is no such thing as half a class.

Therefore, the number of new classes needed is 17 - 15 = 2.

39.

Which of the following options is equivalent to 1 meter?

100 centimeters

10,000 millimeters

10 kilometers

1,000 centimeters

Correct answer: 100 centimeters

1 meter = 100 centimeters. There are 100 centimeters and 1000 millimeters in one meter. One kilometer is equal to 1,000 meters.

40.

If $x \neq 0$ and $x = x^{-3}$, what is the value of x?

1

-1

0

2

Correct answer: 1

The easiest way to solve this problem is to plug the answers into the equation. When you do this, you will see that the only time that $x = x^{-3}$ is when x = 1 or 0. Because $x \neq 0$, then x = 1.

41.

Solve the equation:

4x - 5 = 15

x = 5

x = 4

x = 6

x = 2

Correct answer: x = 5

Solve the equation 4x - 5 = 15

Add 5 on both sides of the equation.

4x - 5 + 5 = 15 + 5

4x = 20

x = 5

42.

The diameter of one bicycle wheel is 22 inches, and its spokes run from the hub (or center) to the edge of the rim. The diameter of another bicycle wheel is 18 inches. What is the difference in inches between the length of the spokes of the two wheels?

2

2.5

1.5

1

Correct answer: 2

The spoke is equivalent to the radius, which is the diameter divided by 2. Therefore, the spoke for the 22-inch wheel is 11 inches. The spoke for the 18-inch wheel is 9 inches.

11 - 9 = 2-inch difference between the two spokes.

43.

If $5x^2 + 2 = 7$, what is the value of $x^2 + 7x$?

8

6

18

12

Correct answer: 8

To solve, you must first solve for x.

$5x^2 + 2 = 7$

$5x^2 = 7 - 2$

$5x^2 = 5$

$x^2 = 5/5 = 1$

$x = 1$

Next, solve for the other equation ($x^2 + 7x$) using the value of 1 for x.

$x^2 + 7x = (1 \times 1) + 7(1) = 1 + 7 = 8$

44.

Brady can grade 5 essays per hour. If he starts grading essays at 4:30 p.m., which of the following is the **best** estimate as to when he will be finished grading 29 essays?

10:30 p.m.

9:30 p.m.

10:00 p.m.

11:00 p.m.

Correct answer: 10:30 p.m.

Since Brady can grade 5 essays in 1 hour, set up a proportion to find out how long it will take him to grade 29 essays.

5/1 = 29/x

5x = 29

x = 29/5 = 5 4/5

The question asks for an estimate, so we can round up 5 4/5 to 6 hours.

Add 6 hours to 4:30 p.m. to get 10:30 p.m.

45.

Solve:

2 : x = 22 : 121

11

20

119

60

Correct answer: 11

Rewriting the ratios as fractions shows us that:

2/x = 22/121

Cross multiply: 22x = 242

242/22 = x
11 = x

46.

Solve the following by multiplying and reducing to the lowest common denominator.

5 x 3/4

3 3/4

3/4

5 3/4

4 3/4

Correct answer: 3 3/4

1. Simplify

15/4

2. Convert to mixed fraction

3 3/4

47.

Solve:

(3/4) - (2/5)

7/20

1/5

1/1

4/5

Correct answer: 7/20

To solve this question, we must first change both fractions to have the same denominator. To do this, we look for the lowest common multiple between the denominators, which in this case is 20. Now, we must change each fraction to have a denominator of 20:

- *3/4 becomes 15/20*
- *2/5 becomes 8/20*

Solve:

15/20 - 8/20 = 7/20

Since the denominators are the same, we just need to subtract the numerators and keep the same denominator.

7/20 is the answer as this cannot be reduced further.

48.

Nora is buying a necklace that costs $6. Sales tax is 7 1/4 cents per dollar. How much will Nora pay in sales tax on her purchase?

$0.44

$0.88

$1.62

$0.24

Correct answer: $0.44

To find sales tax, first convert the fraction to a decimal percent: 7 1/4 percent = 0.0725. Next, multiply the amount of the purchase by the tax rate: $6 multiplied by 0.0725 = $0.44.

49.

A pipe can supply 25 cubic centimeters of water to a tank in one second. How long will the pipe take to fill a 2000-liter tank?

80,000 seconds

800 seconds

8,000 seconds

80 seconds

Correct answer: 80,000 seconds

1 liter = 1,000 cubic centimeters

1 liter × 2,000 = 1,000 cubic centimeters × 2,000 = 2,000,000 cubic centimeters

If 25 cubic centimeters is supplied in one second, 2,000,000 cubic centimeters will be supplied in 2,000,000/25 seconds.

2,000,000/25 = 80,000 seconds

50.

The government has a road construction contract where 280 miles are to be paved. If the contractor has so far completed 180 miles, what percentage of the road is remaining on the contract?

36%

64%

56%

46%

Correct answer: 36%

The length of the road on contract = 280 miles

The completed section = 180 miles

The remaining section = 280 - 180 = 100 miles

To find the percentage of the road remaining, divide 100 by 280 and multiply by 100 to find a percentage.

100/280 × 100% ≅ 36%

51.

Write the following as an equation:

The sum of a certain number and twice the same number equals the product of 3 and 7.

2n + n = 3 × 7

2n = 10 + n

n = 2n + 10

2n = n + 3 + 7

Correct answer: 2n + n = 3 × 7

Let n be the number. Twice that number is 2n. Therefore, the sum of the number and twice that number is 2n + n.

"Equals the product of 3 and 7" means that 3 and 7 will be multiplied after the equal sign.

2n + n = 3 × 7

52.

Increase 97 by 23%.

119.31

122.31

120

121

Correct answer: 119.31

To increase 97 by 23%, first, convert 23% to a decimal and then multiply by 97.

23% = 23/100 = 0.23

0.23 × 97 = 22.31

Then, add this to the original value of 97.

97 + 22.31 = 119.31

53.

A school has 27 classes with 9 students in each class. In order to reduce the class size to 6 students per class, how many new classes must be formed?

14

7

41

6

Correct answer: 14

There need to be 14 new classes formed. The number of students in the school is 27 x 9 = 243. If there are to be no more than 6 students in a class, the number of classes needed is 243/6 = 40.5. We will round up to 41, since there is no such thing as half a class.

Therefore, the number of new classes needed is 41 - 27 = 14.

54.

Rich moved some of his money from his savings account to his checking account to cover the cost of his new car. Rich's savings account originally had $89,848.62 in it, and now his balance is $59,998.62.

Approximately how much money did Rich spend on his new car?

$30,000

$40,000

$25,000

$10,000

Correct answer: $30,000

The difference between approximately $90,000 and $60,000 is $30,000. Approximations are used to save time when a precise figure isn't necessary or practical.

55.

Alisha purchased a new vehicle for $32,500 and she was responsible for paying the $2,112.50 sales tax at the title office. What is the percentage sales tax that Alisha paid on her new vehicle?

6.50%

5%

7%

7.50%

Correct answer: 6.50%

In order to find the percentage of sales tax, divide $2,112.50 by $32,500 and then multiply by 100.

$2,112.50 ÷ $32,500 = 0.065

Next, multiply by 100.

0.065 × 100 = 6.50%

56.

According to the graph, how much money was spent on loans?

$1,380

$780

$300

$2,340

Correct answer: $1,380

$1,380 was spent on loans. In order to find out how much was spent in any given category, multiply the total amount of income for the month, $6,000, by the percentage spent. Since 23% was spent on loans, we will multiply $6,000 x 0.23 = $1,380.

57.

Sandy earned a 2.5% commission on all of her sales. In May, Sandy sold $175,162. How much was Sandy's commission check for May?

$4,379.05

$4,790.50

$5,254.86

$6,274.30

Correct answer: $4,379.05

In order to solve the problem, multiply the sales by the commission percentage.

$175,162 × 0.025 = $4,379.05

58.

Samantha drives x miles the first day, y miles the second day, and z miles the third day. What is the average mileage covered per day?

(x + y + z)/3

x + y + z

(x/3) + (y/3) + (z/3)

(xyz)/3

Correct answer: (x + y + z)/3

To find the average, divide the total mileage by the total time.

Total distance = x + y + z

Total time = 3 days

Therefore, (x + y + z)/3 = average mileage covered per day.

59.

Solve the following by subtracting.

28 1/2 - 12 1/4

16 1/4

16 1/2

16 3/4

16 1/8

Correct answer: 16 1/4

1. Convert 28 1/2 to improper fraction

Use this rule: a b/c = (ac+b)/c

(28×2+1)/2 − 12 1/4

2. Simplify 28×2 to 56

(56+1)/2 − 12 1/4

3. Simplify 56+1 to 57

57/2 − 12 1/4

4. Convert 12 1/4 to improper fraction

Use this rule: a b/c = (ac+b)/c

57/2 − (12×4+1)/4

5. Simplify 12×4 to 48

57/2 − (48+1)/4

6. Simplify 48+1 to 49

57/2 − 49/4

7. Find the Least Common Denominator (LCD) of 57/2, 49/4

Method 1: By Listing Multiples List out all multiples of each denominator, and find the first common one.

2 : 2,4

4 : 4

Therefore, the LCD is 4

Method 2: By Prime Factors List all prime factors of each denominator, and find the union of these primes.

2 : 2

4 : 2,2

Therefore, the LCD is 2×2=4

8. Make the denominators the same as the LCD

57×2)/(2×2) − 49/4

9. Simplify - Denominators are now the same

114/4 − 49/4

10. Join the denominators

(114−49)/4

11. Simplify

65/4

12. Convert to mixed fraction

16 1/4

60.

Which of the following options is equivalent to 1 centimeter?

0.01 meters

1,000 millimeters

0.1 millimeters

0.001 meters

Correct answer: 0.01 meters

1 centimeter = 0.01 meters. 10 millimeters = 1 centimeter, and 1 centimeter = 0.00001 kilometers.

61.

A group of coworkers formed a team in order to motivate themselves to walk more often. Each week, they reported their total miles to their team captain. Last week, the following miles were recorded: 15, 22, 18, 8, 12, and x.

What would the value of x equal if the average number of miles recorded were 15 miles?

15 miles

13 miles

17 miles

18 miles

Correct answer: 15 miles

If the average is 15 miles, then (15 + 22 + 18 + 8 + 12 + x) ÷ 6 = 15.

Breaking down the steps, we solve for x:

1. *(75 + x) / 6 = 15*
2. *(12.5 + x/6) = 15*
3. *x/6 = 2.5*
4. *x = 15 miles*

62.

The diameter of one bicycle tire is 32 inches, and its spokes run from the hub (or center) to the edge of the rim. The diameter of another bicycle wheel is 24 inches. What is the difference in inches between the length of the spokes of the two wheels?

4

12

8

6

Correct answer: 4

The spoke is equivalent to the radius, which is the diameter divided by 2. Therefore, the spoke for the 32-inch wheel is 16 inches. The spoke for the 24-inch wheel is 12 inches.

16 - 12 = 4-inch difference between the two spokes.

63.

Determine the value of x:

3x - 2 = 25x - 37

35/22

22/29

22/35

35/28

Correct answer: 35/22

Rearrange the equation to get variables on one side and whole numbers on the other.

3x - 25x = -37 + 2

Combine like terms.

-22x = -35

Divide both sides by 22.

x = -35/-22

A double negative equals a positive.

-35/-22 = 35/22

64.

Simplify 25% of (3/4 - 1/2)

1/16

1/4

1/8

1/2

Correct answer: 1/16

25% of (3/4 - 1/2)

First, change the fractions to have a common denominator.

3/4 - 1/2

3/4 - (1/2)(2/2)

3/4 - 2/4 = 1/4

Next, find 25% of 1/4.

25% = 25/100

25/100 × 1/4 = 25/400 = 1/16

65.

Express 6,234,093 in scientific notation.

6.234093×10^6

0.6234093×10^7

62.34093×10^5

623.4093×10^4

Correct answer: 6.234093×10^6

To express a number in scientific notation, express it as the product of a number between 1 and 10 and a power of 10. In this case, the number between 1 and 10 is 6.234093. In going from 6.234093 to 6,234,093, you move the decimal point 6 places to the right. Each move represents a multiplication by 10, and 6 moves represents a multiplication by 10^6. Therefore, the correct answer is 6.234093×10^6.

66.

A couple tipped their waitress 18% of their $62.43 check. What amount did the waitress receive as a tip?

$11.24

$9.36

$12.49

$10.61

Correct answer: $11.24

In order to solve this problem, convert 18% to a decimal.

18% = 18/100 = 0.18

Multiply the check total by the percentage and round to the nearest penny.

$62.43 × 0.18 = $11.2374 = $11.24

67.

If the caterer plans on one pound of potato salad per 3 guests, how many pounds of potato salad will be needed for 105 guests?

35 pounds

21 pounds

70 pounds

55 pounds

Correct answer: 35 pounds

This question can be solved by setting up a ratio: 1 pound per 3 guests is equal to x pounds per 105 guests:

1/3 = x/105

Cross multiply and divide to find x:

105 = 3x

105 ÷ 3 = 35 pounds of potato salad

68.

Write the following expression in words:

$2x^2 - 3 = x + 12$

Three less than twice the square of a number is twelve more than the number

Twice the square of a number is twelve more than the number

Twice the square of a number less than three is twelve more than the number

Three less than twice a number is twelve more than the number

---

Correct answer: Three less than twice the square of a number is twelve more than the number

Start with the left side of the equation.

x^2 can be written as 'the square of a number.'

$2x^2$ can be written as 'twice the square of a number.'

$2x^2 - 3$ can be written as 'three less than twice the square of a number.'

Next, write out the right side of the equation.

$x + 12$ is written as 'twelve more than a number.

Therefore, the entire equation can be written as 'Three less than twice the square of a number is twelve more than the number.'

69.

A dealer sold a car, making a loss of 5%. Find the ratio of the cost to that of the selling price.

20:19

20:23

19:20

23:20

Correct answer: 20:19

Let's say the cost of the car is 100%. The loss on the sale is 5%. Subtract to find the percentage that represents the selling price.

100% - 5% = 95%

The ratio of the cost, 100%, to the selling price, 95% is 100:95.

Simplify the ratio to lowest terms.

100:95 = 20:19

70.

Dividing a number by 10 is the same as multiplying that number by what?

1/10

1/5

5

10

Correct answer: 1/10

If x represents a number, then that number divided by 10 is x/10. Multiply x by each answer to find one that equals x/10.

x × 1/5 = x/5, so 1/5 is not the correct answer.

x × 5 = 5x, so 5 is not the correct answer.

x × 10 = 10x, so 10 is not the correct answer.

x × 1/10 = x/10, so 1/10 is the correct answer.

71.

A pharmacy filled 25 brand name prescriptions, 35 generic prescriptions, and some OTC prescriptions. There is a 1 to 3 ratio of generic prescriptions to OTC prescriptions. Which of the following numbers in the problem are needed to find the total number of OTC prescriptions that were filled?

35, 1, and 3 only

25, 1, and 3 only

35, 25, 1, and 3

1 and 3 only

Correct answer: 35, 1, and 3 only

In order to find the actual number of OTC prescriptions, you need the numbers in the initial ratio, plus one actual number. This can be set up as an equation:

$$\frac{1}{3} = \frac{35}{x}$$

You do not need the number of brand name prescriptions because this is not part of the ratio that is given.

72.

A book writing conference of 800 individuals had a 3 to 1 ratio of women to men. How many men attended the book writing conference?

200 men

150 men

220 men

260 men

Correct answer: 200 men

Set up an equation, with x representing the number of men.

Because there were 3 times as many women as men, 3x equals the number of women.

Solve the following equation:

x + 3x = 800

4x = 800

x = 200

73.

Nick has 2 3/4 pounds of wheat flour while his friend has 4 1/5 pounds of wheat flour. How many pounds of flour do they have altogether?

6 19/20 pounds

7 1/20 pounds

6 9/20 pounds

6 1/25 pounds

Correct answer: 6 19/20 pounds

First, change the fractions to improper fractions by multiplying the denominator by the base number and adding it to the numerator.

2 3/4 = 4 × 2 + 3 = 11/4

4 1/5 = 5 × 4 + 1 = 21/5

Next, find a common denominator by multiplying the two denominators.

4 × 5 = 20

Now convert each fraction so that both have denominators of 20.

11/4 × (5/5) = 55/20

21/5 × (4/4) = 84/20

Add the fractions together.

55/20 + 84/20 = 139/20

To convert to a proper fraction, divide 139 by 20.

139/20 = 6 19/20 pounds

74.

The model car was designed on a 1:20 scale of the original car. If the original car had a length of 9 feet and a height of 4 feet, what are the measurements of the model car?

5.4” x 2.4”

4.5” x 2”

18” x 8”

9.2” x 4.2”

Correct answer: 5.4” x 2.4”

This question can be solved by setting it up as a proportion.

First, you will need to convert the feet into inches: 9 feet = 108 inches and 4 feet = 48 inches.

Then, solve each of the following proportions: 1/20 = x/108 and 1/20 = x/48.

- *1/20 = x/108; 20x = 108; x = 5.4 inches.*
- *1/20 = x/48; 20x = 48; x = 2.4 inches.*

Therefore, the 9’ x 4’ car will measure 5.4” x 2.4” as a model.

75.

Forty-five percent of the employees answered that they were not satisfied with the leadership of the organization. If that percentage equals 36 employees, how many employees answered the question?

80 employees

55 employees

64 employees

92 employees

Correct answer: 80 employees

In order to solve the question, convert 45% to a decimal.

45% = 45/100 = 0.45

Then use the following equation with n representing the number of employees that answered the question.

0.45n = 36

n = 36 ÷ 0.45

n = 80

76.

If Craig can walk 2 miles in 26 minutes, how long will it take him to walk 5 miles?

1 hour 5 minutes

52 minutes

1 hour 26 minutes

1 hour 35 minutes

Correct answer: 1 hour 5 minutes

Set up a proportion to find the answer.

2 miles / 26 minutes = 5 miles/ x minutes

2/26 = 5/x

Cross multiply to solve.

2x = 130

x = 65 minutes

There are 60 minutes in an hour, so 65 minutes is equivalent to 1 hour 5 minutes.

77.

The following is a price list for Matt's Pizzeria:

- Small Pizza - $6.99
- Medium Pizza - $7.99
- Large Pizza - $9.99

What is the total cost if Alex orders two large pizzas, and a small pizza?

$26.97

$27.97

$13.98

$20.97

Correct answer: $26.97

Two large pizzas cost twice as much as one:

*$9.99 * 2 = $19.98*

A small pizza costs $6.99

The total cost is $19.98 + $6.99 = $26.97

78.

Sheila borrows $18,000 to make improvements to her kitchen. If the simple interest rate is 9% and she has the loan for a period of seven years, how much will she pay in interest?

$11,340

$10,720

$8,920

$9,840

Correct answer: $11,340

The question asks for the total amount of interest, so multiply the amount of the loan by the interest rate by the number of years: $18,000 × 0.09 × 7 = $11,340.

79.

Tiffany is looking at a right triangle, where angle B is identified as being 42 degrees. How many degrees would angle C be, if angle A is the 90 degree angle?

48

228

52

42

Correct answer: 48

Every triangle contains 180 degrees. You will need to subtract the degrees of angles A and B to find the degrees of angle C: 180 - 90 - 42 = 48.

80.

In 6 hours, Laura can bake 12 cakes. If she continues to work at that rate, how many cakes can she bake in 9 hours?

18

24

27

32

Correct answer: 18

Let x = the number of cakes Laura can bake in 9 hours, and then set up a proportion.

6 / 12 = 9 / x

6x = 12(9)

6x = 108

x = 18

81.

A swim team has won 24 of 36 meets. The team still has 12 more meets in the season. How many of the remaining meets must the team win in order to win 70% of all meets entered during the season?

10

6

14

3

Correct answer: 10

The team has entered 36 meets and will enter 12 more.

36 + 12 = 48

70% of 48 = 0.7 x 48 = 33.6. We will round up to 34 since the team cannot win a portion of a meet.

The team must win 34 meets, and it has already won 24 meets. Therefore, the team must win 34 - 24 = 10 meets.

82.

Jack drives x miles one day, y miles the next, and z miles the third. What is the total number of miles driven by Jack?

x + y + z

xyz

(x + y + z)/3

xy + z

Correct answer: x + y + z

The questions asks for a total number, which requires only addition. Therefore, x + y + z = total number of miles driven.

83.

$|3 + x| = 5$

Which of the following options is the correct solution set for the above equation?

{-8, 2}

{2, 8}

{-8, -2}

{-8, 8}

Correct answer: {-8, 2}

The bars which surround the equation signify "absolute value," which refers to the distance of a number from zero. Therefore, the outcome can be either positive or negative. The equation $|3 + x| = 5$ has two solutions:

$3 + x = - 5$ and $3 + x = 5$

Solve the first equation.

$3 + x = -5$

$x = -5 - 3$

$x = -8$

Solve the next equation.

$3 + x = 5$

$x = 5 - 3$

$x = 2$

Therefore, the set of possible solutions is {-8, 2}

84.

According to the graph, how much money was spent on extra expenses?

$300

$2,380

$780

$1,200

Correct answer: $300

$300 was spent on extra expenses. In order to find out how much was spent in any given category, multiply the total amount of income for the month, $6,000, by the percentage spent. Since 5% was spent on extra expenses, we will multiply $6,000 x 0.05 = $300.

85.

If a horse runs a 0.5-mile track in 6 minutes, how many miles can the horse run in 30 minutes?

2.5 miles

3.5 miles

1.5 miles

2 miles

Correct answer: 2.5 miles

This question can be answered by setting it up as a proportion.

0.5 miles/6 minutes = n miles/30 minutes

0.5/6 = n/30

6n = 15

n = 15/6 = 2.5 miles

86.

$|x - 25| = 10$

Which of the following options is the correct solution set for the above equation?

{15, 35}

{-35, 15}

{-15, 10}

{-15, 15}

Correct answer: {15, 35}

The bars which surround the equation signify "absolute value." When you have an absolute value, it means that the expression is always positive or zero. Thus, the equation $|x - 25| = 10$ has two solutions: $x = 15$, $|15 - 25| = 10$; and $x = 35$, $|35 - 25| = 10$.

87.

What is 2.35 × 0.15 equal to?

- **0.3525**
- 3.525
- 0.03525
- 35.25

Correct answer: 0.3525

Remove the decimals from the numbers and multiply.

235 × 15 = 3,525

When multiplying two numbers with decimals, the correct decimal point location is found by adding the number of decimal places in each number. Since 2.35 has two decimal places and 0.15 also has two decimal places, the total number of decimal places in the answer is 4.

So, 3,525 becomes 0.3525.

88.

The ratio of two numbers is 2:3. If the smaller number is 6/8, what is the other number?

1 1/8

1/2

1/8

2 1/4

Correct answer: 1 1/8

The ratio of two numbers is 2:3, or 2/3.

The smaller number is 6/8, so let the larger number be x.

Set up a proportion to find the larger number.

2/3 = (6/8)/x

2x = (6/8) x 3

2x = 18/8

x = (18/8) ÷ 2

x = 18/8 × 1/2

x = (18 × 1)/(8 × 2) = 18/16 = 1 2/16 = 1 1/8

89.

Solve for x:

$x = 6^4$

- **1,296**
- 36
- 24
- 4,096

Correct answer: 1,296

Exponents indicate that a number should be multiplied by itself repeatedly.

6^4 is equivalent to 6 × 6 × 6 × 6 = 1,296

90.

4 1/16 ÷ 3 1/8

Which of the following options correctly simplifies the above expression?

1 3/10

1 3/4

1 1/4

1 2/3

Correct answer: 1 3/10

In order to simplify the expression, convert the mixed numbers to improper fractions.

4 1/16 = 65/16

3 1/8 = 25/8

In order to divide by a fraction, multiply it by its reciprocal.

65/16 ÷ 25/8 = 65/16 × 8/25

(65 × 8)/(16 × 25) = 520/400.

Reduce the fraction to its lowest terms.

520/400 ÷ 40/40 = 13/10

Convert the improper fraction to a mixed number.

13/10 = 1 3/10

91.

Express 543,456,008 in scientific notation.

5.43456008×10^8

54.3456008×10^7

0.543456008×10^9

54345.6008×10^4

Correct answer: 5.43456008×10^8

To express a number in scientific notation, express it as the product of a number between 1 and 10 and a power of 10. In this case, the number between 1 and 10 is 5.43456008. In going from 5.43456008 to 543,456,008, you move the decimal point 8 places to the right. Each move represents a multiplication by 10, and 8 moves represents a multiplication by 10^8. Therefore, the correct answer is 5.43456008×10^8.

92.

The operations manager is designing a new office layout and assumes 3 office chairs per 2 desks. How many office chairs will be needed for an office building with 30 desks?

45 chairs

90 chairs

30 chairs

60 chairs

Correct answer: 45 chairs

In order to solve this problem, set it up as a proportion.

3 chairs/2 desks = c/30 desks

3/2 = c/30

Cross-multiply to solve.

3 × 30 = 2c

90 = 2c

c = 90 ÷ 2

c = 45

93.

Jackson bought tickets for a new television that his office was raffling off. Jackson purchased 15 tickets, George purchased 30 tickets, Amy purchased 15 tickets, and Greg purchased 45 tickets. If these are the only participants, what is the probability that one of Jackson's tickets will be drawn as the winner of the television?

1/7

3/5

1/2

5/8

Correct answer: 1/7

Probability is the number of desired outcomes divided by the total number of outcomes.

In this question, Jackson purchased 15 tickets (the number of desired outcomes) and there was a total of 105 tickets purchased (the total number of possible outcomes), or 15/105.

The fraction can be simplified.

15/105 ÷ 15/15 = 1/7

94.

Evaluate the expression a + bc if:

- a = 3
- b = 2
- c = 9

21

45

14

33

Correct answer: 21

Plug in the variables in the expression a + bc and solve.

3 + (2 × 9)

3 + 18 = 21

95.

Write the following statement in symbolic form:

The difference between three times a number and 2 times another number must not be less than 2.

3x - 2y ≥ 2

3x - 2y > 2

3x - 2y ≤ 2

3x - 2y < 2

Correct answer: 3x - 2y ≥ 2

Let the first number be x and the second be y.

Three times the first number is 3x

Two times the other number is 2y

The difference is 3x - 2y

Since the difference must not be less than 2, it implies that it can be equal to or more than 2.

Therefore, 3x - 2y ≥ 2.

96.

A bus arrives at the bus station every 2 hours, a second bus arrives every 3 hours, and a third bus arrives every 4 hours. If all 3 buses arrive at 9:00 AM, at what time will all 3 buses next arrive at the same time?

9:00 PM

12:00 PM

3:00 AM

6:00 PM

Correct answer: 9:00 PM

You must look at each time the third bus arrives and determine if it's evenly divisible by the other two. Therefore, you would look at 4, 8, and 12. Because 12 is the only time that is evenly divisible by the times of buses 1 and 2, you know that the buses will all arrive every 12 hours. 9:00 AM = 12 hours = 9:00 PM.

97.

Simplify 54% of $350.

$189

$192

$158

$196

Correct answer: $189

To find 54% of $350, convert 54% to a fraction and multiply.

54% = 54/100

54/100 × $350 = $189

98.

Solve the following by adding.

5/9 + 2/7

53/63

7/9

7/16

1/3

Correct answer: 53/63

1. Find the Least Common Denominator (LCD) of 5/9, 2/7

Method 1: By Listing Multiples List out all multiples of each denominator, and find the first common one.

9 : 9,18,27,36,45,54,63

7 : 7,14,21,28,35,42,49,56,63

Therefore, the LCD is 63.

Method 2: By Prime Factors List all prime factors of each denominator, and find the union of these primes.

9 : 3,3

7 : 7

Therefore, the LCD is 3×3×7=63

2. Make the denominators the same as the LCD

(5×7)/(9×7) + (2×9)/(7×9)

3. Simplify - Denominators are now the same

35/63 + 18/63

4. Join the denominators