Word Problem Quick Guide

26 Difficult Math Problems & Explanations

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Disclaimer

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Reading in Mathematics

You should ALWAYS develop a habit of careful reading when it comes to mathematics. Don't worry if your reading rate is slow – it should be! A good rule of thumb is to read the mathematical equation twice to ensure you understand. As you read carefully you'll be looking for the answers to the following questions

- What is given? (the facts of the problem)
- What is unknown (the answer you need to find)
- How do I proceed (the method or strategy used to find the unknown)

Now… This is a different type style of reading from what you might use when reading a magazine or book. In mathematics directions and problems are compressed into very few words. The use of numbers and symbols further reduces the amount of words and adds to the confusion. Each word, numeral and symbol adds to the equation and SHOULD NOT be missed because of speedy reading. What's my point?

SLOW down.

As with any subject your reading of mathematics will improve with more understanding of symbols and terms. This prep guide is designed to help you with the terms and symbols used in the most common entrance exam questions. I should warn you… These questions are not easy. The truth is, if you can't operate at this level of mathematics it will be almost impossible for you to score competitively on your firefighter entrance exam.

Try to solve all 26 problems first, as a pre test. The answers to each problem and detailed explanations are also in this quick prep guide.

Remember… Ca'lmate

1. Assuming a hose nozzle weighs 4.75 pounds and is alloy comprised of 67% copper, how many ounces of copper are present on the nozzle?

2. Paramedics and medical technicians can figure out medicinal dosages for children according to Clarks Rule. Accordingly a child's dosage is equivalent to an adult dosage times the weight of the child then divided by 150. Using this method, what would be the recommended dosage for a child that weighs 65 pounds if that adult dosage requirement is 40cc?

3. According to Glendale Fire Rescue's chain of command, the District Chief is responsible for staffing stations on the north side. The total number of assets is 72 men. If 1/3 of these men are firefighters and ½ are paramedics, how many personnel remain for rescue duties?

4. A rescue rope is needed for a confined space rescue. The hole is 30 feet deep. The working end requires 6 feet for rescue and the opposite end requires 2x that. What is the total length needed to complete this rescue.

5. What is the area of a triangle if its dimensions are 10 feet long by 8 feet wide?

6. In a first aid training course the number of men in attendance are 9 more than half the number of women present. Suppose there are 16 men in attendance, how many women were attending the course?

7. Jones is practicing for the fire fighter CPAT. His workout plan consists of sit ups, pull ups and push-ups. If he can currently do 58 push-ups, which is 7 more than 3 times the number of push-ups he could do when he started the plan, how many push-ups could he originally do?

8. If one side of a cube measures 18 inches, what is its volume

9. If a triangle had a base of 10 feet and a height of 5.5 feet what would its area be?

10. What is the length of a diagonal line inside a square that measures 51 square feet?

11. Because of Antonio's Spanish speaking ability he currently earns twice the hourly wage he was earning 2 year earlier. If Antonio's current hourly wage is $25.50 per hour, what was his original hourly wage 2 years ago?
12. If a candidate scored 95% on a written exam and answered 152 questions correctly, how many questions were on the written exam?

13. A fully inflated soccer ball has a diameter of 9 inches, how much volume would it occupy (cubic inches)?

14. What is the area of a rectangle if its dimensions are 10 feet long by 8 feet wide?

15. Gabe has $64 in ones and fives, twenty bills in all. How many ones and fives does Gabe have?

16. Rope packaged in 80 foot lengths must be cut into 12 foot pieces to perform a rescue task. If 28 pieces of such rope are needed for the job, how many packages of rope are needed?

17. A man took a trip by car, starting at 11 am at 50 mph. He arrived at his destination at 2 pm. A bicyclist started from the same place at the same time at an average speed of 15 mph. At what time will he reach the same destination?

18. The average person watches 2.6 hours of TV per day. How many minutes will he/she watch in a week?

19. 8 quarts of antifreeze is needed to protect a 12 quart system of a car to -34 degrees. How much antifreeze would be needed to protect a small car with a 5 quart capacity to -34 degrees?

20. A picture 3 feet across is hung in the center of the wall that is 19 feet wide. How many feet from the end of the wall is the nearest edge of the picture?

21. A slow burning candle burns down at a rate of .6 inch per hour. How many hours will a 9 inch candle last?

22. A child wants a toy fire truck. The price tag is $34.00. If the retailer gives the parents a 20% discount how much will they pay for the toy fire truck?

23. Candidate Foreman scored 85, 87, 90, 95 and 100 on his math exams. What would be the average score of all his exams combined at this point?

24. The equations $5x + 2y = 48$ and $3x + 2y = 32$ represents the money collected from school concert tickets sales during two class periods. If X represents the cost for each adult ticket and Y represents the cost for each student ticket, what is the cost for each adult ticket and each student ticket?

25. Of all the firefighters at Grove Valley Volunteer Fire Department, 9% are paramedics. The fire department has 170 members. How many of these firefighters are paramedics?

26. A bus stops at the corner of Jackie Drive and Lorraine Court every half hour between 9 a.m. and 3 p.m. and every 15 minutes between 3 p.m. and 6 p.m. How many times will a bus stop at the corner between 9 a.m. and 6 p.m.?

1. Assuming a hose nozzle weighs 4.75 pounds and is alloy comprised of 67% copper, how many ounces of copper are present on the nozzle?

   Formula: Pounds to Ounces: 1 pound = 16 ounces

   Step 1: Convert pounds to ounces, let X equal the number of ounces in 4.45 pounds

   $$\frac{4.75 \text{ pounds}}{X \text{ ounces}} = \frac{1 \text{ pound}}{16 \text{ ounces}}$$

   $(4.75)(16) = (X)(1)$ Cross-Multiply: multiply the numerator of each side by the denominator of the other side

   ```
     16.00
   x  4.75
   ------
     8000
    112000
   +640000
   -------
    76.0000
   ```

   Solve for X

   Step 2: Find percentage of copper present in nozzle

   67% of copper = 0.67 of copper

   ```
     76.00
   x  0.67
   ------
     53200
   +456000
   -------
    50.9200
   ```

   Multiply percentage of copper by total weight of nozzle

   Answer: *50.92 ounces of copper*

2. Paramedics and medical technicians can figure out medicinal dosages for children according to Clarks Rule. Accordingly a child's dosage is equivalent to an adult dosage times the weight of the child then divided by 150. Using this method, what would be the recommended dosage for a child that weighs 65 pounds if that adult dosage requirement is 40cc?

Formula: Clark's Rule: Child's Dose = (Adult Dose) $\frac{\textit{Child's Weight}}{150}$

Step 1: Substitute the numbers given into formula

Child's Dose = (40) $\frac{65}{150}$

$$\begin{array}{r} 0.43 \\ 150\overline{)65.00} \\ -\ 0 \\ \hline 650 \\ -\ 600 \\ \hline 500 \\ -\ 450 \\ \hline 50 \end{array}$$

$$\begin{array}{r} 150 \\ \times\ \ 4 \\ \hline 600 \end{array} \qquad \begin{array}{r} 150 \\ \times\ \ 3 \\ \hline 450 \end{array}$$

Use long division and multiplication to solve the problem

50 will continue to repeat which will make the answer 0.43 repeating. We will round to the nearest hundredths

$$\begin{array}{r} 40.00 \\ \times\ \ 0.43 \\ \hline 12000 \\ 160000 \\ +\ 000000 \\ \hline 17.2000 \end{array}$$

Answer: *17.2cc*

3. According to Glendale Fire Rescue's chain of command, the District Chief is responsible for staffing stations on the north side. The total number of assets is 72 men. If 1/3 of these men are firefighters and ½ are paramedics, how many personnel remain for rescue duties?

Step 1: Find the number of firefighters and paramedics

(72)(1/3)= 72/3

$$3\overline{)72}\quad 24$$

$$-\ 6$$

$$12$$

(72)(1/2)= 72/2

$$2\overline{)72}\quad 36$$

$$-\ 6$$

$$12$$

$$-12$$

$$0$$

24 Firefighters and 36 Paramedics

Step 2: Let X equal number of personnel. Solve for X

24 + 36 + X = 72

X + 60 = 72

X = 72-60

$$\begin{array}{r} 24 \\ +36 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 72 \\ -\ 60 \\ \hline 12 \end{array}$$

Answer: *12 personnel*

4. A rescue rope is needed for a confined space rescue. The hole is 30 feet deep. The working end requires 6 feet for rescue and the opposite end requires 2x that. What is the total length needed to complete this rescue.

   Step 1: Set up an equation

   30 + 6 + 6(2) = 36 + 12

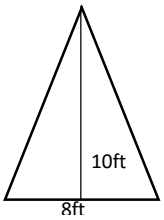
   $$\begin{array}{r} 36 \\ +12 \\ \hline 48 \end{array}$$

   Answer: *48 feet*

5. What is the area of a triangle if its dimensions are 10 feet long by 8 feet wide?

Formula: Area of a Triangle: $\frac{(base)\ (height)}{2}$

Step 1: Substitute the numbers given into formula



$\frac{(8)\ (10)}{2} = \frac{80}{2}$

$$2\overline{)80}\quad 40$$
$$-8$$
$$00$$
$$-0$$
$$0$$

Answer: *40 ft^2*

6. In a first aid training course the number of men in attendance are 9 more than half the number of women present. Suppose there are 16 men in attendance, how many women were attending the course?

Step 1: Set up an equation

$$\text{Number of Men} = 9 + \frac{\text{Number of Women}}{2}$$

Step 2: Substitute the numbers given and solve for Number of Women

$$16 = 9 + \frac{\text{Number of Women}}{2}$$

$$16-9 = \frac{\text{Number of Women}}{2}$$

$$7 = \frac{\text{Number of Women}}{2}$$

$$7(2) = \text{Number of Women}$$

$$14 = \text{Number of Women}$$

Answer: *14 Women*

7. Jones is practicing for the fire fighter CPAT. His workout plan consists of sit ups, pull ups and push-ups. If he can currently do 58 push-ups, which is 7 more than 3 times the number of push-ups he could do when he started the plan, how many push-ups could he originally do?

Step 1: Set up an equation, Let X equal the number of original push-ups

58 push-ups = 7 + 3X Solve for X.

58-7 = 3X

$\frac{51}{3} = X$

$$\begin{array}{r} 17 \\ 3\overline{)51} \\ -\ 3\downarrow \\ \hline 21 \\ -21 \\ \hline 0 \end{array}$$

Answer: *17 push-ups*

8. If one side of a cube measures 18 inches, what is its volume

Formula: Volume of a Cube: Let a = length of any edge of cube, Volume = a^3

Step 1: Substitute the numbers given into formula

Volume = 18^3

18^3 = (18) (18) (18)

$$\begin{array}{r} 18 \\ \times \quad 18 \\ \hline 144 \\ +\,180 \\ \hline 324 \end{array}$$

(18) (18) (18) = (324) (18)

$$\begin{array}{r} 324 \\ \times \quad 18 \\ \hline 2592 \\ +\,3240 \\ \hline 5832 \end{array}$$

Answer: *5832 inches^3*

9. If a triangle had a base of 10 feet and a height of 5.5 feet what would its area be?

Formula: Area of a Triangle: $\frac{(base)(height)}{2}$

Step 1: Substitute the numbers given into formula

Area = $\frac{(10)(5.5)}{2}$

$$\begin{array}{r} 10.0 \\ \times\ 5.5 \\ \hline 500 \\ +\ 5000 \\ \hline 55.00 \end{array}$$

When multiplying by a decimal, line up the decimals and solve normally. (All whole numbers have an invisible decimal at the end of it. EX: 10 is the same as 10.0, 10.00, 10.000) After you have solved the equation, sum the number of decimal places in each number used and that's how many decimal places are need in the answer. EX: 10.0 and 5.5 have one decimal place each so the answer will have 2 decimal places.

Area = $\frac{55}{2}$

$$\begin{array}{r} 27.5 \\ 2\overline{)55.0} \\ -\ 4 \\ \hline 15 \\ -\ 14 \\ \hline 10 \\ -\ 10 \\ \hline 0 \end{array}$$

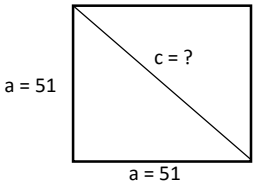
When you have a remainder you can add a decimal at the end of the whole number to continue solving the long division equation. This equation has a remainder of 1 so you will add a decimal and bring down a zero to complete the problem.

Answer: *27.5 feet*^{2}

10. What is the length of a diagonal line inside a square that measures 51 square feet?

Formula: Pythagorean Theorem: $a^2 + b^2 = c^2$

Step 1: Substitute the numbers given into formula



$51^2 +$ $51^2 = c^2$

Step 2: Solve for c

$(51)(51) + (51)(51) = c^2$

$$\begin{array}{r} 51 \\ \times\ 51 \\ \hline 151 \\ +\ 2550 \\ \hline 2601 \end{array}$$

$2601 + 2601 = c^2$

$$\begin{array}{r} 2601 \\ +\ 2601 \\ \hline 5202 \end{array}$$

$5202 = c^2$

$\sqrt{5202} = c$

Answer: $\sqrt{5202}$ *feet*^{2}

11. Because of Antonio's Spanish speaking ability he currently earns twice the hourly wage he was earning 2 year earlier. If Antonio's current hourly wage is $25.50 per hour, what was his original hourly wage 2 years ago?

Step 1: Set up an equation

Current Wage = 2(Old Wage)

25.50 = 2(Old Wage) Solve for Old Wage

(25.50/2) = Old Wage

$$
\begin{array}{r}
12.75 \\
2\overline{)25.50} \\
-\ 2 \\
\hline
05 \\
-\ 4 \\
\hline
15 \\
-\ 14 \\
\hline
10 \\
-\ 10 \\
\hline
0
\end{array}
$$

Answer: $12.75 per hour

12. If a candidate scored 95% on a written exam and answered 152 questions correctly, how many questions were on the written exam?

Step 1: Set up an equation, Let X equal the number of questions on the exam

$95\% = \frac{95}{100}$

$\frac{95}{100} = \frac{152}{X}$ Cross-Multiply: multiply the numerator of each side by the denominator of the other side

$(95)(X) = (152)(100)$ Solve for X

$$\begin{array}{r} 152 \\ \times\ 100 \\ \hline 000 \\ 0000 \\ +15200 \\ \hline 15200 \end{array}$$

$(95)(X) = 15200$

$X = \frac{15200}{95}$

$$\begin{array}{r} 160 \\ 95\overline{)15200} \\ -\ 95 \\ \hline 570 \\ -\ 570 \\ \hline 00 \\ -\ 0 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 95 \\ \times\ 6 \\ \hline 570 \end{array}$$

Answer: *160 questions*

13. A fully inflated soccer ball has a diameter of 9 inches, how much volume would it occupy (cubic inches)?

Formula: Volume of a Sphere: (4/3)(Pi)(Radius)^3

Formula: Pi = ∏ ≈ 3.14

Formula: Radius of Sphere: Diameter/2

Step 1: Substitute the numbers given into formula

Radius = $\frac{9}{2}$

Volume = $(4/3)(3.14)(9/2)^3$

$\frac{4}{3} \times \frac{3.14}{1} = \frac{(4)(3.14)}{3}$

3.14	2 decimals
x 4	+ 0 decimals
12.56	2 decimals

$\frac{(4)(3.14)}{3} = \frac{12.56}{3}$

Volume = $(12.56/3)\,(9/2)^3$

$(9/2)^3 = \frac{9}{2} \times \frac{9}{2} \times \frac{9}{2}$

(9)(9) = 81

81
x 9
729

(2)(2) = 4

(4)(2) = 8

$(9/2)^3 = \frac{729}{8}$

Volume = $\frac{12.56}{3} \times \frac{729}{8} = \frac{(12.56)(729)}{24}$

$$\begin{array}{r} 12.56 \\ \times \quad 729 \\ \hline 11304 \\ 25120 \\ +\,879200 \\ \hline 9156.24 \end{array}$$

Volume = 9156.24/24

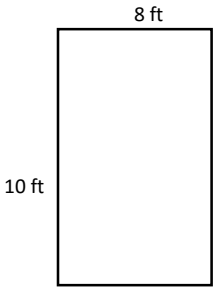
$$\begin{array}{r} 381.51 \\ 24\overline{)9156.24} \\ -\,72 \\ \hline 195 \\ -\,192 \\ \hline 36 \\ -\,24 \\ \hline 122 \\ -120 \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

Answer: *381.51 inches*^{3}

14. What is the area of a rectangle if its dimensions are 10 feet long by 8 feet wide?

Formula: Area of Rectangle: length x width

Step 1: Substitute the numbers given into formula



Area = (10)(8)

$$\begin{array}{r} 10 \\ \times\ \ 8 \\ \hline 80 \end{array}$$

Answer: *80 ft^2*

15. Gabe has $64 in ones and fives, twenty bills in all. How many ones and fives does Gabe have?

Step 1: Set up two equations, let X equal number of ones and Y equal number of fives

(1) 1X + 5Y = 64
(2) X + Y = 20

(1) 1X + 5Y = 64
(2) -(X + Y = 20)

System of Equations: 2 equations, 2 unknowns: Change equation (1) or (2) so that you have one variable when summing equations together.

(1) 1X + 5Y = 64
(2) + - X - Y = -20
0 + 4Y = 44

Sum equations

Solve for Y

Y = 44/4

$$4\overline{)44} = 11$$

- 4
04
- 4
0

Step 2: Plug Y into an original equation to solve for X

X + Y = 20

X + 11 = 20

X = 20-11

X = 9

Step 3: Check Your Answers, Plug X and Y into other equation

1X + 5Y = 64

(1)(9) + (5)(11) = 64

9 + 55 = 64

64 = 64

Answer: *9 Ones and 11 Fives*

16. Rope packaged in 80 foot lengths must be cut into 12 foot pieces to perform a rescue task. If 28 pieces of such rope are needed for the job, how many packages of rope are needed?

Step 1: Find how many feet of rope is needed

28 pieces of 12 foot rope

$$\begin{array}{r} 28 \\ \times\ 12 \\ \hline 56 \\ +280 \\ \hline 336 \end{array}$$

Step 2: Find how many packages of rope needed

$$\begin{array}{r} 4.2 \\ 80\overline{)336.0} \\ -320 \\ \hline 160 \\ -\ 160 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 80 \\ \times\ 4 \\ \hline 320 \end{array} \qquad \begin{array}{r} 80 \\ \times\ 2 \\ \hline 160 \end{array}$$

Answer: *5 packages of rope*

17. A man took a trip by car, starting at 11 am at 50 mph. He arrived at his destination at 2 pm. A bicyclist started from the same place at the same time at an average speed of 15 mph. At what time will he reach the same destination?

Step 1: Set up an equation to find X which equals the total distance taken by the car

Car traveled from 11am to 2pm = 3 hours

$\frac{\text{X miles}}{\text{3 hours}} = \frac{\text{50 miles}}{\text{1 hour}}$ Cross-Multiply: multiply the numerator of each side by the denominator of the other side

(X)(1) = (50)(3) Solve for X

$$\begin{array}{r} 50 \\ \times\ 3 \\ \hline 150 \end{array}$$

Step 2: Set up an equation to find Y which equals the total time taken by the bike

$\frac{\text{15 miles}}{\text{1 hours}} = \frac{\text{150 miles}}{\text{Y hours}}$ Cross-Multiply: multiply the numerator of each side by the denominator of the other side

(15)(Y) = (150)(1) Solve for Y

Y = 150/15

$$\begin{array}{r} 10 \\ 15\overline{)150} \\ -15\downarrow \\ \hline 00 \\ -0 \\ \hline 0 \end{array}$$

The bike started at 11am and traveled for 10 hours

Answer: *9 pm*

18. The average person watches 2.6 hours of TV per day. How many minutes will he/she watch in a week?

Formula: Hours to Minutes: 1 Hour = 60 Minutes

Formula: Weeks to Days: 1 Week = 7 Days

Step 1: Set up an equation using the formulas and numbers given. Let X equal the amount of time TV will be watched in a week

$\frac{2.6 \text{ hours}}{1 \text{ day}} = \frac{X \text{ hours}}{7 \text{ days}}$ Cross-Multiply: multiply the numerator of each side by the denominator of the other side

$(2.6)(7) = (X)(1)$ Solve for X

$$\begin{array}{r} 2.6 \\ \times \quad 7 \\ \hline 18.2 \end{array}$$

$\frac{18.2 \text{ hours}}{X \text{ minutes}} = \frac{1 \text{ hour}}{60 \text{ minutes}}$

$(18.2)(60) = (1)(X)$

$$\begin{array}{r} 18.2 \\ \times \quad 60 \\ \hline 000 \\ +\ 10920 \\ \hline 10920 \end{array}$$

Answer: *10,920 minutes*

19. 8 quarts of antifreeze is needed to protect a 12 quart system of a car to -34 degrees. How much antifreeze would be needed to protect a small car with a 5 quart capacity to -34 degrees?

Step 1: Set up an equation, let X equal the amount of antifreeze need for the small car

$$\frac{\text{8 quarts}}{\text{12 quart system}} = \frac{\text{X quarts}}{\text{5 quart system}}$$

Cross-Multiply: multiply the numerator of each side by the denominator of the other side

$(8)(5) = (12)(X)$

Solve for X

$40 = 12X$

$40/12 = X$

$$12\overline{)40.0} = 3.33$$

$-\ 36$

40

$-\ 36$

4

40 will continue to repeat which will make the answer 3.3 repeating. We will round to the nearest hundredths

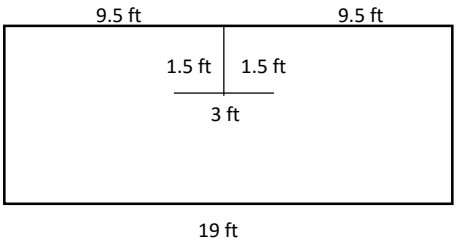
Answer: *3.33 or about 4 quarts*

20. A picture 3 feet across is hung in the center of the wall that is 19 feet wide. How many feet from the end of the wall is the nearest edge of the picture?

Step 1: Create a diagram to visualize the setting

$$
\begin{array}{r}
9.5 \\
2\overline{)19.0} \\
-\,18 \\
\hline
10 \\
-10 \\
\hline
0
\end{array}
$$

$$
\begin{array}{r}
1.5 \\
2\overline{)3.0} \\
-\,2 \\
\hline
10 \\
-10 \\
\hline
0
\end{array}
$$



$$
\begin{array}{r}
9.5 \\
-\,1.5 \\
\hline
8.0
\end{array}
$$

Answer: *8 feet*

21. A slow burning candle burns down at a rate of .6 inch per hour. How many hours will a 9 inch candle last?

Step 1: Set up an equation, let X equal the amount of time the candle will last

$\frac{0.6 \text{ inches}}{1 \text{ hour}} = \frac{9 \text{ inches}}{X \text{ hours}}$

Cross-Multiply: multiply the numerator of each side by the denominator of the other side

$(0.6)(X) = (9)(1)$

Solve for X

$X = (9/0.6)$

When dividing by a decimal get rid of the outside decimal by moving the decimal place. However many times you move the outside decimal, do the same to the inside.

$$0.6\overline{)9.0}$$

$$\begin{array}{r} 15 \\ 6\overline{)90} \\ \underline{-6} \\ 30 \\ \underline{-30} \\ 0 \end{array}$$

Answer: *15 hours*

22. A child wants a toy fire truck. The price tag is $34.00. If the retailer gives the parents a 20% discount how much will they pay for the toy fire truck?

Step 1: Find 20% of $34.00

20% = 0.20

$$\begin{array}{r} 0.20 \\ \times \quad 34 \\ \hline 080 \\ +\ 0600 \\ \hline 06.80 \end{array}$$

2 decimals
+ 0 decimals
2 decimals

Step 2: Subtract 20% discount from price tag to find amount to pay

$$\begin{array}{r} 34.00 \\ -\ \ 6.80 \\ \hline 27.20 \end{array}$$

Answer: $27.20

23. Candidate Foreman scored 85, 87, 90, 95 and 100 on his math exams. What would be the average score of all his exams combined at this point?

Formula: Average: Sum of Numbers in Set/Number of Terms in Set

Step 1: Substitute the numbers given into formula

$$\begin{array}{r} 85 \\ 87 \\ 90 \\ 95 \\ +\ 100 \\ \hline 457 \end{array}$$

Average = 457/5

$$\begin{array}{r} 91.4 \\ 5\overline{)457.0} \\ -45\downarrow \\ \hline 07 \\ -5 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

Answer: 91.4

24. The equations 5x + 2y = 48 and 3x + 2y = 32 represents the money collected from school concert tickets sales during two class periods. If X represents the cost for each adult ticket and Y represents the cost for each student ticket, what is the cost for each adult ticket and each student ticket?

Step 1: Use the System of Equations to solve for X and Y

(1) 5X + 2Y = 48
(2) 3X + 2Y = 32

System of Equations: 2 equations, 2 unknowns: Change equation (1) or (2) so that you have one variable when summing equations together.

(1) 5X + 2Y = 48
(2) -(3X + 2Y = 32)

Sum equations

(1) 5X + 2Y = 48
(2) + -3 X - 2Y = -32
2X = 16

Solve for X

X = 16/2
X = 8

5(8) + 2Y = 48

Plug X into an original equation, Solve for Y

40 + 2Y = 48

2Y = 48 -40

2Y = 8

Y = 8/2

Y = 4

Step 2: Check Your Answers, Plug X and Y into other equation

3X + 2Y = 32

3(8) + 2(4) = 32

24 + 8 = 32

32 = 32

Answer: Adult tickets are $8, Student tickets are $4

25. Of all the firefighters at Grove Valley Volunteer Fire Department, 9% are paramedics. The fire department has 170 members. How many of these firefighters are paramedics?

Step 1: Find 9% of 170

9% = 0.09

```
  0.09
x  170
   000
  0630
+ 00900
  15.30
```

2 decimals
+ 0 decimals
2 decimals

Answer: About 15 or 16 are paramedics

26. A bus stops at the corner of Jackie Drive and Lorraine Court every half hour between 9 a.m. and 3 p.m. and every 15 minutes between 3 p.m. and 6 p.m. How many times will a bus stop at the corner between 9 a.m. and 6 p.m.?

Formula: Hours to Minutes: 1 Hour = 60 Minutes

Step 1: Find how many times the bus stops from 9 am to 3 pm

9 am to 3 pm = 6 hours

0.5 hours + 0.5 hours = 1 hour, therefore, there are 2 stops every hour

6 hours x 2 stops every hour = 12 stops

Step 2: Find how many times the bus stops from 3 pm to 6 pm, use the formula to convert hours to minutes

3 pm to 6 pm = 3 hours

$$\frac{3 \text{ hours}}{X \text{ minutes}} = \frac{1 \text{ hour}}{60 \text{ minutes}}$$

(60)(3) = (1)(X)

$$\begin{array}{r} 60 \\ \times \quad 3 \\ \hline 180 \end{array}$$

X = 180 minutes

Stops are every 15 minutes for 180 minutes

$$\begin{array}{r} 12 \\ 15\overline{)180} \\ -15\downarrow \\ \hline 30 \\ -30 \\ \hline 0 \end{array}$$

Step 3: Total the number of stops from 9 am to 3 pm and form 3 pm to 6 pm

12 + 12 = 24

Answer: 24 times